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BRAITHWAITE'S RETROSPECT.

VOL. LXXII, JULY—DECEMBER, 1875,

THE
RETROSPECT OF MEDICINE:

BEING

A HALF-YEARLY JOURNAL

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND
PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

W. BRAITHWAITE, M.D.

LATE LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN
AT THE LEEDS SCHOOL OF MEDICINE, ETC.

AND

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LEEDS SCHOOL OF MEDICINE.

ASSISTANT-SURGEON TO THE LEEDS HOSPITAL FOR WOMEN AND CHILDREN.

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SYNOPSIS,

(ARRANGED ALPHABETICALLY), CONTAINING

A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THIS VOLUME, SHOWING AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE HALF-YEAR.

AFFECTIONS OF THE SYSTEM GENERALLY.

CHOLERA.—*Subcutaneous Injection of Chloral Hydrate.*—I beg to bring forward what I consider to be the right principle on which to treat collapse of cholera. Presuming the morbid state against which we have to contend to be one of asphyxia, caused by spasms of involuntary muscular fibres, due to a condition of hyperactivity of the sympathetic nervous system, the logical inference distinctly points to the exhibition of a remedy calculated to neutralise this condition. Such remedies are to be found in the class of agents which directly depress the activity of the muscular fibres of the circulatory apparatus. It is no good giving medicines by the mouth, as they are generally immediately rejected. I suggest the *hypodermic injection of pure sedatives*, which, if given in sufficient quantities, actually do produce syncope by their palsyng action on the heart. In a number of experiments with injection of chloral hydrate hypodermically, in bullfrogs, we found that chloral hydrate caused the death of the frogs, with the heart in the most *complete diastole*, thereby proving that it is one of the most powerful vascular sedatives that we possess. It so happened that I had no opportunity of trying the hypodermic injection of a pure sedative till August, 1873. I then had a soldier in collapse under my care. I dissolved ten grains of chloral hydrate in 100 minims of water, and injected this quantity under the skin of the arms, in four different places. The record of this case will be found in the Indian Medical Gazette for Nov., 1873. Reaction was established in about five hours, and the patient made an excellent recovery, without any inconvenience from the punctures. (Mr. A. R. Hall, p. 27.)

DIPHTHERITIC, SCARLATINAL, AND OTHER FORMS OF SORE THROAT.—*Quinine as a Gargle.*—For the last four months I have treated every suitable case of sore-throat that I have met with in my wards in the Royal Infirmary and elsewhere,

with a gargle composed, as a rule, of two grains of sulphate of quinine and five minims of dilute sulphuric acid to each ounce of water. Sometimes I have been able to increase the strength; sometimes I have been compelled to diminish it. When well tolerated, the stronger it is the better. The results I have obtained fully confirm my favourable anticipations. From a considerable number of cases I draw the following conclusions:—1. Simple non-syphilitic ulcers of the throat, under this treatment, at once assume a healthier aspect and heal rapidly. 2. In syphilitic ulcers, the local treatment has always been accompanied by the internal administration of iodide of potassium, or some other suitable constitutional remedy; but my impression is that, in these cases, the cure is hastened by the quinine gargle. 3. Its effect in the sore-throat of scarlatina is very marked, the pultaceous secretion being checked, and the inflammatory swelling diminished. 4. It is of comparatively little use in the early stage of cynanche tonsillaris, over which tincture of aconite, in minim doses frequently repeated, has so decided a control. When, however, abscess followed by abundant discharge of pus results, its beneficial influence in checking the suppuration and promoting healing is marked. 5. In the slighter forms of diphtheritic sore-throat it answers admirably, preventing the extension of the disease, and promoting the separation of the membranous exudation. It is, however, in severe cases of true diphtheria that I hope it will prove most useful. I have now employed it in three cases of this disease, and in all the result has been highly satisfactory. (Dr. D. J. Brakenridge, p. 24.)

EXCESSIVE FATIGUE.—*Effect of Alcohol, Beef Extract, and other Ingesta on the System.*—The experience gained during the Ashantee campaign showed that total abstinence improved the health, and that alcohol, though apparently beneficial when given with food after the day's march was done, was injurious while on the march, the reviving effect passing off after, at the utmost, two and a half miles' march had been accomplished, and being succeeded by languor and exhaustion as great or greater than before. When again resorted to its reviving power was less marked; and its narcotizing influence was often traceable in the dulness, unwillingness to march, and loss of cheerfulness of the men. Meat extract, on the contrary, in quantities of not less than half an ounce at a time, was not only powerfully reviving, but sustaining, and so was coffee, though to a considerably less extent. This evidence in favour of meat extracts is of great value at the present time when their power to act either as food or stimu-

lants is so much disputed. The sustaining power of thin gruel, made from boiled oatmeal, during heavy work is well shown in one of the appendixes. This agrees perfectly with the observation of Alpine travellers, that small quantities of food at short intervals prevent exhaustion, and with our own experience that, although unaccustomed to exercise, we could carry a knapsack for thirty miles a day without fatigue by simply taking something to eat every two hours. (Dr. E. A. Parkes, Practitioner, Aug. p. 120.)

GOUT.—*A New Sign of Gout.*—An elongated uvula is in old people very suggestive of gout. There are few, except gouty persons, who habitually have it at or after middle age. There is a condition of what might be called pharyngitis associated with this, when the whole of the mucous membrane of the pharynx passes into a condition very like that of the elongated uvula, looking clogged, heavy, œdematous, and, as it were, slow to move, and covered with an unusually thick glossy epithelium. The pharynx of a tubercular person differs from this, and is covered with granular prominent glands. (Sir James Paget, p. 243.)

RHEUMATISM WITH NEUTRAL OR ALKALINE URINE.—There are cases of rheumatic fever which, whilst they present all the ordinary features of the disease, have this exceptional one, neutral or alkaline urine. There is the sour perspiration and usual joint affections. These cases are much benefited by the tincture of the muriate of iron—and, indeed, the ordinary alkaline treatment is inadmissible. It is quite possible that this medicine may have a wider range in its application in this disease than I am at present disposed to allow; but I think the fact that we may have acute rheumatism in patients in whom the urine is not acid in its reaction is a point worthy of serious attention, and one which should lead medical practitioners carefully to examine its condition in all cases, and to shape their treatment accordingly. (Dr. J. F. Duncan, p. 45.)

SCARLET-FEVER.—*Cold Baths.*—In some cases of scarlet-fever cold is as necessary for the relief of hyperpyrexia as in any other febrile disease. There need not be the fear about its use that is generally felt. The rash will not be driven in, but the strength of the patient being conserved, the full development and free course of the rash will rather be favoured. The difficulty is perhaps less in treating scarlet-fever than in dealing with other cases because the patients are usually young and easily lifted in and out of the bath, but when from the weight of the patient or the weakness of the attendants it is impossible to use the bath, the patient

may easily be packed in wet sheets, with or without pieces of ice placed here and there, or indiarubber bags or large bottles filled with ice may be placed round the patient. The bath gives better results than any other plan when it can be thoroughly carried out, and the most satisfactory way is to begin with the bath at 98° or 100° , and cool down gradually to about 70° . It is of course better that the temperature of the patient and of the water should be frequently taken, but the hand is generally a good enough guide as to the water, and the appearance of the patient always indicates the improvement in his condition. It is worth consideration whether it will not ultimately turn out to be a better plan to keep the patient in the bath for many hours, even for a day or longer if necessary, cooling the water very gradually down, and maintaining it at whatever degree is found to keep the patient's temperature nearest to a healthy point. In the treatment of diseases or injuries of the skin, no evil, but, on the contrary, great good results from much more prolonged baths; and it seems far more reasonable to prolong the period of immersion than to take the patient out and allow the temperature to rise, to be again and again reduced in the same way. (Dr. J. W. Eddison, p. 21.)

The Sulpho-carbolates as Prophylactics against Scarlet-fever and other Zymotic Diseases.—Dr. Sansom fed two guinea-pigs “with pills composed of arrowroot mixed with sodium sulpho-carbolate. No other food was given. In four days the little animals had consumed 275 grains of the salt. No obvious effect was produced, except a slight looseness of the evacuations.” The animals were then killed, and it was found that “the flesh showed a marked tendency to resist putrefaction.” The administration of sodium sulpho-carbolate is an indirect means of administering carbolic acid; and inasmuch as at least one-fourth of the weight of the sulpho-carbolate employed consists of carbolic acid, we find that an amount equalling from fifteen to ninety grains per diem can be administered of the latter. It is obvious that the direct administration of this amount of carbolic acid would, from its nauseous character and its difficulty of manipulation, be not readily accomplished; and there would be a danger of the toxic action of the latter being manifest—a result which does not occur when the sulpho-carbolates are administered. One would imagine that, in this latter case, there is a gradual evolution of carbolic acid, which at no time is in sufficient amount to manifest its poisonous action.” Commencing with moderate doses of the sodium sulpho-carbolate, I soon found that, as stated by Dr. Sansom, from twenty to thirty grains,

every two hours, could be easily taken by adults for a considerable length of time, without any inconvenience or physiological disturbance of any kind. *I determined some time ago, whenever I met with the disease in my private practice, to give the sodium sulpho-carbolate to all individuals exposed to the infection who were not protected by a previous attack.* For I argued, if by internal disinfectants we can destroy or inhibit fever-germs after they have multiplied indefinitely, and produced their pathological effects within the body, may we not reasonably hope that, by previously disinfecting the tissues of the body, the germs which first find their way into them will be much more easily destroyed or paralysed? I have administered the sulpho-carbolate of sodium for the above purpose in doses varying, according to age, from five to thirty grains three or four times a day, and sometimes, when well borne more frequently, to those exposed to the poisons of scarlet-fever, diphtheria, and measles. It was given in seven families to twenty-two individuals exposed to the poison of scarlet-fever; in three families, to fifteen individuals exposed to the poison of diphtheria; and in three families, to eight persons exposed to the poison of measles. The diseases have not in a single instance extended beyond the individuals first affected. (Dr. D. J. Brakenridge, Dr. W. Scott, pp. 7, 13.)

SCARLATINAL DROPSY.—In the two late epidemics of scarlatina which have occurred at Perth, the following was found to be the best plan of treating the dropsy which sometimes followed. When the case was one of moderate severity, and uræmic symptoms not a conspicuous feature, sharp purgation with drastics, such as the comp. jalap or comp. scammony powders, answered very well. It was found, however, that a very large dose was required to produce the desired effect, 3 ss. or even ℥ii. of comp. jalap being often required for a child five or six years old. This purgation was alternated by vapour-baths, and at a later period, when a febrile action was diminished, inf. of digitalis with acet. of potash was administered with good results. It will be found, however, that dropsical symptoms in the majority of such cases will persist in spite of all these means, and go on from bad to worse till alarming pulmonary complications show themselves, or convulsions supervene. What now is to be our line of procedure? We venture to affirm, that at this juncture abstraction of blood either general or local—certainly general when there are convulsions—will act in a most beneficial manner, and convert in a short time an apparently hopeless case into a remediable one. In order to accomplish this,

however, we must not hesitate to take blood freely, as ten ounces from the arm of a boy ten years of age, or four ounces by cupping over the loins in a child four or five years of age. Neither must we be deterred from this by the supposed anæmic condition which some writers on renal disorders have ascribed to such patients. The truth is, they are not anæmic at all, but are suffering from an acute disorder associated with a very different condition of blood from that existing in chronic renal disorders, and the rapidity with which they recover after sharp antiphlogistic treatment sufficiently shows this. Depletion acts like a charm in convulsions from acute uræmia, and we have seen a free diuresis set up in forty-eight hours after its employment, unaided by any other remedies. (Dr. J. P. Bramwell, p. 16.)

TYPHOID FEVER.—*Effect of Digitalis.*—Digitalis may be very useful in reducing the temperature, but a case is related by Dr. Murrell in which it no doubt assisted in bringing the case to a fatal end. (Practitioner, Nov., p. 351.)

AFFECTIONS OF THE NERVOUS SYSTEM.

APOPLEXY.—*What is Serous Apoplexy?*—We occasionally see patients who are insensible and evidently suffering from apoplexy, and yet on examining the brain after death no evidence of hemorrhage can be found. Without intending to suggest that the term serous apoplexy is a correct one, I may fairly assume that cases do occur, in which no cerebral rupture is discovered after death, and no absolute reason appears to be present why the patient should have died. There is interference with circulation through brain substance sufficient to produce coma and paralysis: sometimes such cases do not die, the patient gradually recovers from his coma; hemiplegia remains for a time, but it ultimately yields to rational treatment. In many cases the absolute breakdown takes place after the symptoms have developed, and that cerebral hemorrhage or sanguineous apoplexy is not an antecedent so often as is supposed, but is the consequence of continued impediment to circulation after the coma has appeared. In such cases, whenever doubtful as to whether hemorrhage has taken place, our exertions should be directed to the arrest of the congestive stage which supervenes upon that which causes the first symptoms. These in all cases depend in the first instance upon an anæmic condition of some portion of the cerebral organs, and which anæmia preceded the active development of the attack. This condition of anæmia probably precedes the acute attack in all

these cases. In the majority of those which I have met with in which absolute recovery has taken place, I have come to the conclusion that they were due to a condition of blood allied to that which attends the gouty diathesis: that there is a condition of the system which may be fairly styled as that of suppressed gout, and that if the cerebral organs could be examined without injury to life, a condition of capillaries would be found somewhat similar to that which exists in those swellings which suddenly arise in the areolar tissue of persons subject to atonic gout. Common sense appears to tell us that the circulation having to pass through damaged tubes must not be pressed, that it is important not to put extra pressure upon an already damaged hydraulic machine, and that if we increase action in the circulation by pressing more matter into it, we shall only be adding fuel to fire. Our efforts should rather be directed first to the removal from the blood of those elements of debased and used-up organic matter which represent used-up tissue, and which from some cause or other have not yet been carted out of the system through the proper excretory organs. These we should get removed as quickly as possible. At the same time we should take off pressure from the vessels themselves, and so lessen the chance of rupture in the now bloated tissue of the brain. (Dr. A. Carpenter, p. 57.)

CARDIALGIA AND TETANUS.—*Nitrite of Amyl*.—Funkel recommends the use of this remedy in cardialgia. After a few inhalations the pain disappears, and if it return, as in a few instances it does, they are to be renewed. The neuralgias accompanying menstruation have also yielded to its influence. One case of tetanus, which had resisted the action of all the means hitherto applied, yielded promptly to the inhalation of two drops three times a day. (Practitioner, Aug. p. 134.)

CHOREA.—*Arsenic*.—Thirty or forty years ago Mr. Hammond, of Whetstone, had great reputation for the cure of chorea by arsenic. In a letter written by him on the subject he said: "The health has need to be well supported. A full diet of meat and two glasses of port wine should be given daily; the latter with water, if the subject be feeble or excitable. An egg should be taken for breakfast, and all trash in diet avoided; that is, all that adds to the labour of digestion without contributing to support. The only purgative ever employed should be rhubarb or the compound decoction of aloes; but only to regulate the bowels, never to purge. The health should be sustained by air and exercise, and diet only modified by the absence or presence of plethora. With menstrual irregularity, riding on horseback will be useful,

and air as much as possible, but not to the point of fatigue." Again, he says:—"The mineral solution of arsenic is the strongest tonic known; it often subdues ague when quinine has failed. My reputation in the cure of chorea rests wholly on the use of this preparation. I give it in that dose (nine drops three times a day), beginning with four, and gradually, in ten days, getting to nine. I have never known the remedy to fail; at least be assured that few cases of chorea will resist this treatment. If it disagree or headache be felt, lower the dose one drop." These are the *ipsissima verba magistri* never published before. They have lain by neglected for many years, and their resuscitation at the present moment appears to me opportune. The preparation is that adopted into the London Pharmacopœia as the liquor arsenici chloridi. In the British Pharmacopœia, there is a modification of its strength. It is no other than De Valangin's mineral solvent. The directions given are for the treatment of young people; but the difference of the Pharmacopœia must be allowed for. (Mr. G. Gaskoin, p. 55.)

INSOMNIA.—The combination of chloral, morphia, and atropia in certain relative proportions, used subcutaneously or by the mouth, is extremely well adapted to the treatment of insomnia, and is more effective in the relief of pain than either agent alone. This combination is especially suitable in cases of insomnia in the subjects of fatty and dilated heart, and in the irritable heart of the chronic smoker. One drachm of chloral is to be added to four of water, and thirty minims of this contain seven and a half grains. Into this solution is to be put one grain of morphia. Another solution may be thus made: Six drachms of chloral, four grains of sulphate of morphia, and a quarter of a grain of atropiæ sulphas in two ounces of water. (Dr. Bartholow, p. 360.)

NEURALGIA.—The influence of quinine and iron upon neuralgia forms part of the common stock of medical knowledge: but I think it is less widely known that these remedies are far more efficacious in combination than when given singly; that they are far more efficacious in small and frequently-repeated doses than in larger ones separated by longer intervals, even though the same absolute amount may be taken; and that the certainty and celerity of their action may be much increased by the addition of a small quantity of morphia. I am indebted to my friend Mr. Gregory, of Stroud, for the knowledge that a pill containing a grain of quinine, two grains of potassio-tartrate of iron, and from a twelfth to a twenty-fourth of a grain of morphia, according to circumstances, and taken every hour until an expected paroxysm

has been missed, will often cure periodic neuralgia with a rapidity and certainty not to be attained by any other method of administering the same medicines. I have also found this formula to be of the greatest possible value in many cases of eye-disease, in which local changes were progressing too rapidly to be overtaken by the use of a grain or two of quinine twice or thrice a day as a "tonic," but in which they were promptly arrested when the patient was brought under the influence of the specified combination. (Mr. R. B. Carter, p. 255.)

Nitrite of Amyl in Facial Neuralgia.—One of the most obvious effects of nitrite of amyl is to cause flushing of the face, and congestion of the parts around the maxillæ. This property renders it a remedy worth trying in cases of facial neuralgia depending upon anæmia. Some cases are related illustrative of this. (Dr. G. H. Evans, p. 49.)

ODONTALGIA.—*Gelseminum.*—Gelseminum is a remedy which has very active properties. Several cases of poisoning by it have occurred. It acts mainly upon the sensory portion of the nervous system. As a remedy in neuralgia the dose of the powder of the root is from one to two grains. I have always used a tincture prepared according to the following formula: Gelsemin root, in coarse powder, two ounces; rectified spirit, twenty fluid ounces. Moisten the powdered root with ten ounces of the spirit, and allow the mixture to stand for twenty-four hours. At the end of that time pack in a percolator, and add the remaining ten ounces of spirit. When the fluid has ceased to flow, remove the contents of the percolator and press them. Add the pressed liquid to that obtained by percolation, filter, and make up with rectified spirit to a pint. Eleven minims of the tincture are equal to about one grain of the root. The tincture contains only a trace of tannin, and may be given with any of the preparations of iron. (Dr. J. Sawyer, p. 51.)

Gelseminum has not been tried half enough by the profession. It sometimes acts beautifully, but its effects are chiefly confined to the nerves of the upper and lower jaw. Dr. Spencer Thompson gives larger doses than usual. He gives 20 minims of the tincture as a first dose, to be repeated any time after an hour and a half if not relieved—a third dose is seldom required. (Dr. S. Thompson, p. 357.)

TOOTHACHE.—I have for a long time very frequently been successful in giving patients relief by stopping the hollow tooth with a paste made in the palm of the hand, by dropping on

to a good pinch of the bicarbonate of soda as much tincture of opium or of the vinum opii as the soda will take up, working the whole into a paste, and putting into the tooth. (Dr. W. B. Holderness, Practitioner, May, p. 373.)

OPIUM POISONING.—*Belladonna*.—In a case of poisoning by laudanum one-sixth of a grain of atropine was administered hypodermically and repeated in a quarter of an hour. After the second dose the pupils which were a mere point began to relax, the pulse which was 100 became slower and acquired more volume, and the patient showed signs of returning consciousness. The injections of atropine were continued at intervals, and the patient recovered. Previous to the use of the atropine it was the opinion of those around him that the patient was getting gradually worse, and that the case would prove fatal. (Dr. Heaton, of Leeds, Medical Times and Gazette, April 17, p. 413.)

PARALYSIS OF FACIAL NERVE.—When the facial nerve is paralysed from central disease, it is, according to my experience, always the case that the facial muscles retain, either entirely or in great part, their power of being excited by faradism. On the other hand, the absence of excitability by faradism and the exaggerated influence of interrupted voltaism were completely characteristic of facial paralysis *à frigore*. Nearly three months after the seizure, this treatment was commenced, and afterwards continued almost daily for three weeks. Stöhrer's constant current battery was employed, at first four cells being engaged, then six, and finally eight. One rheophore was placed on the cheek at the point where the facial nerve breaks into its two great divisions, and the other at various parts of the face; but especially often near the ala of the nostril. The current thus employed caused vigorous contractions of many muscles affecting the nostril and mouth. At other times one rheophore was applied near the outer canthus, and then the current caused contractions of the orbicularis palpebrarum muscle. Each sitting occupied about twenty minutes. One rheophore was lifted and reapplied at tolerably regular intervals of about 30 or 40 in the minute. This patient became affected on the other side, and I now bethought me of using the finger as a rheophore, and tried it in the following manner. An assistant having applied to the patient's left temple a sponge rheophore connected with one (it was not material which) pole of a Stöhrer's constant current battery, I grasped in my left hand another sponge rheophore coming from the other pole, and then applied the forefinger of my right hand, covered with a single thickness of muslin wetted

with pure water, to the right upper eyelid of the patient. The battery was Weiss's (Foveaux's), which had considerably run down, so that it was perhaps only half-strength. Cautiously increasing the number of cells (it was long before any electric sensation was felt), I found that the current from between 30 and 40 cells could be employed in this manner, my body, through which it was bound to pass offering a great resistance, and serving indeed as a rheostat. The application was made through the closed lids. The finger proved an exceedingly convenient rheophore. I could apply exactly the amount of pressure desirable, and could reach portions of the globe which it would have been exceedingly difficult to act upon in any other manner. Moreover the strength of the current could be gauged at every instant. That which was employed was just sufficient to cause me to feel a distinct shock in the knuckle of my right forefinger every time the current was interrupted. Occasional flashes of light were observed by the patient, but he felt no pain. We thought we could see a little improvement in power after the first day's application, but there was no doubt of this at all at the close of the second sitting. Not to weary with a daily record, I may say that this treatment was applied on fifteen occasions in all, the applications extending over a period of three weeks. The time occupied at each sitting was from twenty to thirty minutes. A daily increase in power of the muscles was noted; and when the patient returned home, after the last application, he was absolutely well. The lid was entirely under control, and the movements of the left eye were in every respect perfect. Of course, therefore, there was no longer any double vision, and the use of the shade was discarded. The patient has since remained quite well. (Dr. T. Buzzard, p. 63.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

HEALING OF WOUNDS BY BLOOD TISSUE.—Blood effused into an open wound, provided that wound is treated antiseptically, does not perish, but becomes an organised structure and a medium of healing. In a case in which the changes were carefully watched and noted, the clot became distinctly vascular about the twenty-sixth day. On the thirtieth day an epidermic formation was observed on the edges of the clot continuous with the epidermis of the surrounding skin. The practical value of this method of healing wounds by blood-tissue has yet to be tested by further experiments. (Mr. J. Chiene, p. 202.)

LEUKHÆMIA SPLENICA.—*Phosphorus.*—A man thirty seven years of age was the subject of leukhæmia splenica. The blood by the microscope appeared to contain nearly twenty times the normal number of white corpuscles. The spleen was so much enlarged as to reach to within two inches of the umbilicus anteriorly and to below the crest of the ilium inferiorly. The fiftieth of a grain of phosphorus, afterwards increased to the thirtieth, was given three times a day, all other treatment beyond nourishing diet being discontinued. The first symptom of improvement was a fall in the rapidity of the pulse, the next was a diminution of the pyrexia. In four months the patient was apparently cured, the spleen was smaller, but still much enlarged, and the blood contained no excess of white corpuscles, but these were nearly double the natural size. As far as is yet known, no case of spontaneous cure of leukhæmia has been reported, or of recovery under indifferent treatment. I believe, therefore, that in this case, as well as in Dr. Broadbent's, the cure is exclusively attributable to the use of the phosphorus, and he is warmly to be congratulated on the successful verification of an induction, and on the discovery for a cure for at least some cases of a disease so painful, distressing, and hopeless as this almost invariably proves to be. It may be found to be more beneficial in the earlier rather than in the later stages of the disease. What its influence may be when the vast excess of white corpuscles sometimes observed has been attained, can only be verified by further observation. (Dr. Broadbent, Dr. Wilson Fox, p. 74.)

LIGATURE OF A MAIN ARTERY FOR ACUTE TRAUMATIC INFLAMMATION—Mr. Bryant says "To arrest acute inflammation in a limb, the deligation of the main artery of the limb, or the arrest of the circulation through it by pressure upon the artery, has been adopted. Dr. Campbell, of New Orleans, speaks highly of the practice, and even affirms that no portion of an extremity should be amputated for destructive inflammation without the surgeon attempting the practice. Upon the suggestion of Mr. Maunder, of the London Hospital, in 1867, Mr. Little applied a ligature to the femoral artery for acute suppuration of the knee, with a success sufficient to prove its value; and the late Mr Moore, of Middlesex Hospital, acupressed the brachial artery with a good result." Dr. Robert Druitt in his article on 'Inflammation,' also says: "Mr. Maunder, of the London Hospital, has tied the femoral artery in several instances of severe inflammation of the lower limb, and has spoken favourably of the results. Mr. Maunder's first case was so treated by him without any knowledge of the American experiences we have referred to, and his results were

as satisfactory as those of Dr. Campbell. The late Mr. C. H. Moore also compressed the brachial artery for severe traumatic inflammation of the hand, acting on Mr. Maunder's suggestions, and in that case also the remedy had a very striking effect." (Mr. C. F. Maunder, p. 170.)

1. Ligature of the superficial femoral artery has arrested acute inflammation consequent on a wound of the knee-joint. 2. Ligature of a main artery will quickly diminish profuse suppuration, and prevent death by exhaustion. 3. While it arrests profuse suppuration, it will, by allowing the patient to gain strength, afford an opportunity for amputation at a future time. 4. Gangrene and secondary hemorrhage, as the result of ligature, should not be anticipated in the healthy subject. 5. The dread of these has arisen from our knowledge of the consequences of the ligature in instances of known diseased vessels—aneurism for example. 6. A slough on the heel, caused by the pressure of a splint, was quickly detached, and the wound soon closed, although the superficial femoral had been tied a few days previously. 7. Symptoms of inflamed bone ("starting pains") quickly disappeared. (Mr. C. F. Maunder, p. 183.)

NÆVUS.—A very small nævus may be, as is well known, destroyed by applying a number of points of vaccine lymph around its circumference. If a little larger, the needle of a galvanic cautery, or a needle dipped in nitric acid or perchloride of iron and passed several times through it may answer the purpose. These are examples of methods of treatment of the simple form of nævus maternus; but, when it comes to be a case of the other kind, which is the case that is most frequently dealt with in hospital, such a method of treatment is altogether unsuitable. Subcutaneous nævus or nævoid tumour, to which I refer, consists of a dilatation of the vessels of the venous side of the tumour; hence it is often called venous nævus. To understand my observations, recollect that a tumour of the nature of aneurism by anastomosis is found of two varieties, according as the venous side of the circulation or the arterial side is affected. Subcutaneous nævus may, if not very large, be destroyed by passing through it a few threads, which may be dipped in some acrid substance, and are to be left in the part so as to produce inflammation in their tracks. Another plan of dealing with nævus is by the application of caustic substances, especially when it is a combination of the two kinds of the disease, and when the tumour is of comparatively small size, and is upon the edge of the lip, the tip of the nose, the brow, or the cheek. The application of strong nitric acid on a piece

of wood held against the spot for a considerable time has the effect of producing an eschar or slough. That slough may separate with a certain amount of inflammation; that inflammation coagulates the blood, and gradually obliterates the tumour as before. The third plan is to produce coagulation in the interior by the introduction of the galvanic cautery, or a red-hot iron, if you like—the actual cautery. But the galvanic cautery is best, because it gives you a continually red-hot needle. It produces coagulation in the neighbourhood of the needle; the coagulation extends till the tumour is consolidated and obliteration takes place. Another plan is to introduce, by means of a very fine syringe and hollow needle, a drop or two of perchloride of iron. Perchloride of iron is, of all salts of which we are aware, the one which most rapidly coagulates the blood; hence, when we have hemorrhage from a wound in which we cannot get the blood-vessels tied, we take a small bit of perchloride of iron, or take a piece of lint and dip it in a solution of perchloride of iron, and it will coagulate the blood at once. A few drops of this fluid introduced in subcutaneous nævus will coagulate the blood, and produce consolidation and obliteration as before. Take care, however, that you never employ this form of treatment of nævus in the neighbourhood of a large vein, such as a nævus situated at the lower part of the neck, which is a rare thing, or a nævus near the circumference of the orbit, because a portion of the blood coagulated by the introduction of this fluid may become detached, and may form what is called embolus, or a floating clot, and may get into the circulation of the blood and float away nobody knows where; and may continue floating on until it produces a plug, which may interrupt the circulation in the vessels and produce serious consequences. When the tumour is too large for this treatment, ligature must be tried. Ligature is applicable to nævus when it is circumscribed; when you can, without difficulty, pass a needle under the base of the tumour. The needle is armed with a piece of string, then the string is passed beyond the edge of the tumour, brought underneath its base, and made to emerge beyond its base on the opposite side. The tumour is again transfixed at right angles to the former direction, and a double ligature is brought through underneath the tumour. We have thus two ligatures passing underneath the tumour in one direction, and two passing through in the opposite direction. Next, the ligatures are tied together, and then the whole is constricted and tied together by the free ends. Thus the whole of the base of the tumour is circumscribed, and strangulation takes place by the string passing round

the base of the tumour. If the surgeon be not satisfied with the result of the strangulation, he can put another ligature round the base on the outside. If the skin be affected, the tumour is transfixed without any previous operation; but, if it be subcutaneous, and the skin comparatively unaffected, it may be saved by dissecting back four flaps, and the tumour may be transfixed as before. These *nævi*, when circumscribed, are more or less incapsulated. This capsule consists of the very tissue which permeates throughout the interior. While there is no well-defined capsule in which it lies during the progress of its growth, the tissue gradually becomes so condensed, that it forms itself into a capsule; hence, if you adopt the plan suggested by John Bell, which is the principle that must guide us in dealing with these tumours—namely, never to cut into it, but to cut it out—you can deal with almost any tumour. Apply the knife in such a way as to cut the tissue exterior to the tumour, and by your incision take out the tumour entire. Do not spare it; do not leave a single bit of it; cut on the exterior of it, and lift it out with its capsule.—(Dr. George Buchanan, p. 189.) [An encapsulated *nævus* may be turned out of its capsule without any cutting—merely using the handle of the scalpel.—Eds.]

Scarless Eradication of Nævi.—For eradication of *nævi* upon the arms and face, where it is necessary to avoid a mark, the following is an excellent plan of treatment. Having carefully made out the limits of the *nævus* both as to depth and circumference, a needle armed with not too fine a wire is passed through the skin, half round the tumour, and out again opposite the place of entrance; the needle is then again introduced at the same puncture by which it had just emerged, and, passing round the other side of the tumour, makes its final exit at the opening first made. In certain cases, large size or peculiar shape of the tumour may render it necessary to bring out the needle twice instead of only once. However that may be, the effect is to enclose the base of the tumour in a wire loop, both ends of which, emerging at the same opening, are under perfect control. These might merely be twisted together till the requisite tightness is attained, but in this practice certain inconveniences arise which I have obviated by another expedient. A vulcanite oval plate, about three-quarters of an inch long and an eighth of inch thick, has two holes bored obliquely through its thickness; and on its external surface two little studs project close to where these holes emerge, and where also they are furthest apart. By bringing the end which passes by the right side of the *nævus* through the left hole, and *vice versa*, the wire is made to cross, while the oblique direction of

the holes permits it to run smoothly. The surgeon, having thus arranged his appliance, draws upon the wires until the nævus is rather tense, and then twists each end round the nearest stud. A piece of lint, slit so as to bestride the wire, is introduced between the skin and the vulcanite button, and prevents any undue pressure by the edges of the plate. On the third or fourth day the wire will have become somewhat loosened: one of the ends is to be untwisted from the stud, drawn tight, and again secured. This process is to be repeated until the wire comes away, when, as must be evident, it has not merely strangulated, but has cut through the base of the nævus with all its vessels of supply; in fact, it has acted like a slow and sure *écraseur*. (Mr. R. Barwell, p. 198.)

Nævi and Erectile Tumours.—Galvano-puncture.—Galvano-puncture is specially indicated in those cases of nævi and erectile tumours in which the erectile tumour is deep-seated and covered by healthy, undiscoloured skin. Until a few years ago, our interference in such cases was limited to dissecting off and reflecting the superimposed textures, so as to expose the tumour without touching it with the knife, and then strangulating it by strong ligatures, and, when the growth had sloughed and separated, replacing the flaps of skin; or by ligature of large arterial trunks indirectly connected with the growth, as, for example, ligature of the carotid artery for orbital erectile growths. The former method was attended with grave inconveniences and dangers; and the latter, besides entailing risk, was most uncertain in its effects, as you can readily understand from the nature of the disease. More recently, injections with the perchloride of iron took the place of these methods, and, in a great number of cases, answered very well, but in others a very considerable amount of sloughing took place before the rest of the tumour had been consolidated, and in such cases severe hemorrhage occurred, and the life of the patient was endangered. In some cases also the injections of perchloride were attended with a rapidly fatal issue, apparently from thrombosis. I must, however, say that I never saw such a result, though I have long used, and continue to use, the perchloride of iron injections, and I can only attribute such accidents to the neglect of tearing up the texture of the tumour before injecting the perchloride. (Prof. Spence, p. 200.)

POPLITEAL ANEURISM.—The treatment by compression has a favourable influence on the after-progress of cases generally, by enlarging the collateral circulation, and thus lessening the tendency to gangrene. From this cause it is held that

the mortality after the ligature is lessened when it becomes necessary to tie the artery on the failure of compression. On the whole, we may say that, allowing for accidental circumstances, the results of the two methods have been as nearly identical as is possible in a long series of cases extending over many years and a large variety of districts. And this, I must say, is to me a striking argument in favour of the more recent method. The cure by pressure ought to be attempted in all ordinary cases of popliteal aneurism. When the sac is imperfect, or even very weak, it is better, I think, to resort to ligature at once; and if the aneurism is situated towards the knee-joint, or is rapidly growing, I do not advocate long perseverance in the attempt at compression; nor, indeed do I think that in any case protracted compression is a benefit to the patient, or diminishes the percentage of failure. (Prof. T. Holmes, p. 158.)

The best Method of Compression for the Cure of Popliteal Aneurism.—There can be no question in the first place, that the finger of a trained and intelligent person is a more discriminating, more accurate, and less distressing agent for stopping or checking the circulation than any form of instrument, however ingeniously devised. The femoral artery, as it lies in the groin, side by side with its vein and in close proximity to the bone, can be easily commanded, in a thin or even in a moderately stout person, with little expenditure or force, with an almost total absence of pressure on the vein, and usually without much pain, provided that the person compressing knows how to make the pressure. Now all these points are of great importance, and they together constitute a very great superiority for digital as against instrumental pressure, considered with respect to its facility of application only. The rapidity of the cure in digital pressure is one of its great advantages, closely connected with the less force which it requires and the less pain which it produces. The patient is thus enabled to bear the prolonged application of an efficient amount of pressure, and cure is often produced with astonishing rapidity. Digital pressure should always be made with sufficient force to stop the pulsation of the tumour, and no more. The plan of allowing a perceptible amount of circulation to go on through the tumour, which was a favourite one in my younger days, and was recommended by the Dublin surgeons, is now, I believe, allowed not to have any advantage. It is quite possible that some blood may be really passing through the aneurismal sac, even though no pulsation can be felt; but however this may be, it is certain that the total

obliteration of pulse in the aneurism does not retard, but, on the contrary, greatly hastens the cure, and that in some cases the disease has been cured in a very short time. (Prof. T. Holmes, p. 163.)

PRIMARY DISEASE OF THE HEART.—The following is a brief summary of the palliative or curative measures to be adopted in the treatment of primary disease of the heart. 1. That it is of the utmost importance in the treatment of primary disease of the heart to reduce to a minimum the calls upon that organ. Consequently light labour alone must be attempted; and rest in bed is often very desirable at the commencement of a course of treatment, as well as at intervals afterwards. 2. Frequently much relief can be afforded when dropsy is present by unloading the distended venous system. Brisk catharsis gives great relief, and does not depress the patient, as might be apprehended. 3. In all cases the heart must be acted upon directly by agents which increase the vigour of the ventricular contractions, of which digitalis is the chief. This agent may be given uninterruptedly for years without any so-called cumulative action, if the cases are properly selected. If given in improper cases unpleasant consequences may follow its administration. (Dr. J. Milner Fothergill, *Lancet*, May 29, p. 755.)

VARICOSE VEINS OF THE LEG.—*Excision.*—A man had a varix on the thigh, apparently a part of the internal saphenous vein. It formed an elevation $4\frac{1}{2}$ inches long by $2\frac{1}{2}$ broad, and $\frac{3}{4}$ inch above the level of the surrounding skin. The following was the treatment adopted: Chloroform having been administered and the blood removed from the limb by the application of Esmarch's elastic bandage and tourniquet, Mr. Davis-Colley made a longitudinal incision 5 inches in length over the varix. He then dissected out the whole of the convoluted mass which turned out to be a single irregularly dilated vein, more than a foot in length, when extended. A catgut ligature was applied to the vein at the upper and lower parts of the swelling and the whole of the intermediate portion was removed. No sutures were used to draw the edges of the wound together. A spray of carbolic acid diluted with 40 parts of water was employed during the whole of the operation, and the wound was dressed with carbolic gauze dipped in a mixture of 1 part of carbolic acid to 40 of olive oil. The elastic band, which had been used as a tourniquet was taken off before applying the dressing, and a small amount of venous hemorrhage occurred which was readily controlled by pressure. The practice of ligaturing the veins over pins, and then subcu-

taneously dividing them, is not altogether exempt from danger, and it is in some respects decidedly inferior to the one above described. There is always considerable uncertainty as to when the pins can be safely removed, and the subcutaneous section of the vein is occasionally inadequate to produce its obliteration, whereas, after excision, the destruction of that part of the vessel is complete, and the patient is spared the inconvenience of having the pins in his skin, and the pain of their removal. (Mr. Davies-Colley, p. 186.)

WOUND OF THE PALMAR ARCH.—When you cannot reach the cut artery and tie or twist it, it is not enough to bind a graduated compress on the wound, and put the hand and forearm in a sling; nor will you have taken every precaution against a recurrence of the bleeding when, in addition to a well-adjusted compress, you have methodically bandaged the limb from the finger-tips upwards, a proceeding which may seldom be safely omitted; but you should also secure the hand and forearm upon a well-padded splint reaching beyond the fingers and above the elbow, and strictly forbid the slightest attempt on the patient's part to actively move the limb. If he wishes to shift its place he must lift it upon the splint with his other hand. (Mr. J. W. Hulke, p. 184.)

AFFECTIONS OF THE RESPIRATORY SYSTEM.

ASTHMA. — *Spasmodic*. — Dr. K. Anderson has used the subcutaneous injection of morphia in several cases of severe asthma with great success. He says:—The rapidity with which the distressing symptoms are controlled is very striking. In from five to ten minutes after the injection has been administered, the patient finds himself well, *per saltum*. There is no perceptible interval between the agony of breathlessness of one moment and the perfect calm and rest of the next. I have seen a man who had been labouring to speak — jerking out his words syllable by syllable — suddenly rise to his feet, and, with easy and unembarrassed respiration, finish his remarks in an uninterrupted flow. So soon as the morphia gets fairly into the current of the circulation, that moment the spasm is relaxed, and the patient is at peace, with nothing but his exhaustion to testify to the sufferings he has undergone. The dose which I have used has been in all cases one-sixth of a grain of the hydrochlorate of morphia in a strong solution. In no instance has its use been followed by any more unpleasant result than slight nausea. (Dr. K. Anderson, Practitioner, Nov., p. 322.)

CROUP.—*Copaiva*.—Dr. Miller has used *copaiva* extensively in croup for thirty years, and had before spoken of its efficacy. He was in the habit of placing a phial of balsam *copaiva* in possession of all his patients subject to croup, directing them to take doses of twenty or thirty drops before sending for medical aid. The result was, that whilst he used to be frequently called out at night to attend croup cases, he was now but seldom annoyed at night by similar calls. So great was the faith of his patients in this remedy, that he had often been applied to for his so-called “croup medicine.” It was especially valuable in the early stage. (Dr. Miller, p. 90.)

HÆMOPTYSIS.—Ergot seems to be a good remedy in many of these cases. Dr. Jas. Williamson has treated 50 cases with more or less success. The fifty patients were suffering from phthisis in different stages, and the amount of the hemorrhage varied from abundant bright streaks on the sputa to the expectoration of several ounces of blood. As the cases all occurred in hospital practice, very little time was lost between the advent of the hæmoptysis and the exhibition of the remedy. The ergot was invariably given by the mouth and in the form of the liquid extract. Much has been said about the success of the subcutaneous injection of ergotin and its superiority to this plan, but since there was no difficulty in any of the cases in administering a draught, and as the drug acted in most instances with a promptitude which was sufficiently satisfactory, the hypodermic method was not employed. Forty-minim doses of the liquid extract may be given twice within the first hour, and, guided by the results, at least every two hours afterwards, the dose being diminished and given less frequently as the hemorrhage subsides. I have never observed any disagreeable effect follow even upon the administration of large quantities within short periods, but, as a general rule, if four or five full doses make no distinct impression upon the hemorrhage, the remedy should be abandoned for another. Care should be taken to use a fresh and sound preparation of the ergot. (Dr. J. Williamson, *Lancet*, Nov. 13, p. 696.)

WINTER COUGH.—A mode of treatment productive of much benefit in chronic winter cough, is the administration of tar internally combined with use of *ipecacuanha* spray. The tar may be given in small capsules each containing two to three grains. Tar water or “*eau de goudron*” is also made, which contains two grains in the drachm, and may be taken in sugar and water, or with claret at dinner, the combination being almost tasteless. The *ipecacuanha* wine for use as spray should be diluted with at least an equal quantity of

water and Richardson's double-balled spray-producer may be used for the purpose of atomising it. (Dr. W. Murrell, p. 91.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

FISSURE OF THE SOFT PALATE.—A slight modification of the operation for closing fissure of the soft palate is the introduction of a silver wire suture through both sides of the cleft velum, but some distance from the edges of the fissure, prior to the use of the knife for freshening its edges. The ends of the wire are brought out of the mouth. When the cutting part of the operation is concluded the wire can be tightened up, and the edges thus approximated at once, and the remaining sutures can be approximated more exactly than they otherwise could. (Mr. E. Bellamy, p. 204.)

HEMORRHOIDS.—*Injection of Ergot.*—Dr. G. W. Semple reports five cases of piles, two of which were accompanied by prolapsus of the rectum, which he treated successfully by injecting into the rectum after every fæcal discharge half a drachm of the fluid extract of ergot with half an ounce of water. One had a greatly enlarged spleen, which was reduced to its normal size by the treatment. A third was that of a pregnant woman who suffered no inconvenience from the treatment. (St. Louis Med. Journal—Practitioner, Aug., p. 142.)

HERNIA.—*Inversion.*—The treatment of hernia by inversion consists in placing the patient in such a position as to bring the force of gravity into play to reduce the rupture. This may easily be effected by raising the foot of the patient's bed, and keeping it supported at an angle of 45°. In this posture the intestines naturally gravitate towards the upper part of the abdominal cavity, and gradually draw in the ruptured portion. It is evident, from the nature of the case, that a force acting gradually and equally from within the abdomen must be far safer and more effectual than any pressure applied externally. The use of the taxis, however carefully applied, must almost always involve some bruising of the parts, which would have an injurious effect should the attempts at reduction be unsuccessful and an operation become necessary. (Surgeon-Major Thornton, p. 204.)

Radical Cure of Hernia.—The only instruments used are a double spear-pointed semi-circular needle, with an eye in each point, silver wire, a piece of cork, soft wood, or roll of adhesive plaster. The parts being well shaven, three lines are drawn with a brush and tincture of iodine, parallel to

the direction of the hernial orifice, the centre line being immediately over the internal orifice and passing down to the external orifice, if the hernia be oblique inguinal; in other varieties, immediately over the greatest enlargement of the tumour. The needle is then taken hold of by the left hand at its unthreaded end; then the right hand, with the thumb and forefinger, pulls up the skin and superficial fascia as high as it can be done to the right of the middle line, letting the middle line be just below the point of the thumb. The threaded end is then pushed through the fold held below the point of the thumb and index finger. The fold is then let loose, and the threaded end taken by its point with the thumb and fingers of the right hand; it is then pulled on until the unthreaded end comes just under the outside line of right side of the operator, and left side of patient. The index finger of the left hand is made to invaginate the integuments as far as possible, and the finger is pushed to the right under the left tendon of patient, feeling well the wall. The right hand then raises the needle, so as to have its point directly over the point of the finger and a little to the outside of it. The needle is then pushed directly down through the tendon into the peritoneal cavity; at this stage, the point of the index finger of the left hand is carried to the right side of the patient, and held under the tendons; the needle is then moved about to see if it be loose, and turned in its curve so as to carry the curved portion of its point under the invaginated integuments, &c., to about one-quarter of an inch of the right tendon; the end is then brought out on the outside line of the patient's right side; this is done by pressing down on the threaded end held by the surgeon's right hand. The index finger of the left hand is then taken out, and the threaded end let go, and the unthreaded end is taken hold of by the right thumb and index finger of the right hand. It is now gently pulled on until the threaded end comes above the tendon. The point threaded is then reversed, and keeping well down on the tendon, is finally pushed out at the first puncture and pulled entirely out, leaving the two ends of the ligature close together in the same puncture. We have thus put a ligature entirely around the two sides of the rupture, with a sufficient portion of the tendon and muscles to give the thread sufficient surface to act on; and now, by pulling on the two ends, the rupture is closed internally by the replacing of its natural support, and then the ends are tied around a piece of cork or soft wood. If one ligature do not close the opening so that the point of the finger cannot be pushed under the wire, another wire is put in in the same way. Before tying the first, enough must be put in

to completely close the rupture, and they should not be more than a quarter or half an inch apart. The operation can be performed on either side; but it is best in inguinal hernia to start the needle from the side opposite to the ilio-pubic ligament. This enables the needle to be pushed down by the side of the ligament. This method is simple and easy to perform, and is applicable to all external herniæ. The process is the same, and made with the same needle and silver wire. Of course, it is not applicable to internal hernia, as diaphragmatic, obturatic, ischiatic, entrocystic, invaginal, vaginal and rectal, as they cannot be reached without resorting to the direct method, which ought to be done in all cases of strangulated hernia, when this needle will much facilitate a closure of the incision. The wires are to be left in from four to seven days, according to the inflammation of the parts. Lotion of sugar of lead and morphine are to be applied externally, according to circumstances.—(Dr. G. Dowell, of Galveston, London Med. Record, April 21, p. 244.)

PRURITUS ANI.—*Marine Lint.*—Two years ago I suggested the use of marine lint for the relief of pruritus ani. I have often been written to, inquiring what this lint was, and to-day I have a letter asking about it. As it does not appear to be generally known, I beg to state that it is finely carded tow soaked with tar, kept in tin cases. It is made by Maw and Son, of London. (Dr. James Thompson, Lancet, May 29, p. 779.)

TAPEWORM.—*Creasote.*—Creasote possesses properties most unfavourable to the vitality of the lower grades of animal life. It may be used as a vermifuge with advantage. In the case of a tubercular man suffering also with tapeworm, I gave him one drop of creasote made into a pill with pulv. tragacanthæ co. three times a day, half an hour after each meal, so as to impregnate the ingesta. As the stomach bore the medicine well for two days I increased the dose to two drops three times a day for two more days, and then to three drops at a time for two more days. On the seventh day I gave him a dose of castor-oil (aperients acted very strongly on this patient, or I should have combined it with sp. terebinthinæ). On the fifth day of the treatment a worm eight yards long came away, and he had slight diarrhœa. Not seeing me, he continued the creasote on the sixth day, and took the oil on the seventh, which acted very freely, but brought no more worm away. (Mr. H. Brickwell, p. 95.)

VOMITING.—Perhaps the most severe cases of vomiting, and certainly the most distressing, are caused by over-stimulation

during pregnancy. Apart however from pregnancy, there are two well-defined conditions of alcoholism in which vomiting is a prominent symptom. In one the vomiting is the result of an oft-repeated debauch, of the previous night perhaps, in which case we may trust to the offender's sensations of wretchedness, backed by the more material agency of the vomiting, to work a cure, for the present at least; in the other the vomiting is due to altered gastric secretion and to degenerative changes resulting from chronic inflammation of the coats of the stomach; a condition which is more or less remediable, until, through long continuance, thickening takes place locally, the vital organs become congested, and the digestion and other functions of life are permanently impaired. (Dr. P. H. Stokoe, p. 97.)

AFFECTIONS OF THE URINARY SYSTEM.

THE CATHETER.—In a case of paralysis when the bladder has lost its power of expulsion, is there any method by which, in catheterizing the male bladder, the pressure of the column of urine in the instrument could be done away with? There is. By using a very long flexible catheter, and bending down the outer half of it, so as to make the urine leave the instrument at as low a level as it enters it within the bladder, we balance the column which is obstructing the evacuation with one which facilitates it, and the only thing required of the bladder in this case is to overcome the friction of the urine against the interior of the tube. By bending down the end of the catheter still further, we convert it into a syphon, the long leg of which is external, and, the descending column of urine more than balancing the ascending one, the urine, having once begun to flow, is bound to go on running, until the bladder is entirely empty. The urine no longer requires to be pressed out, it is drawn out. But flexible catheters are not passed with the same readiness as silver ones, and they are in many respects inconvenient. It would be desirable to have the ordinary metallic catheter used as the short leg of the syphon. This I have succeeded in arranging, by the very simple method of putting on a flexible tube to the extremity of a silver catheter, ending with a curve, instead of the straight abrupt extremity that the catheters at present in use have. I have had a catheter of this sort constructed for me by Mr. Gardner, of Edinburgh, and, after seeing it, I am much surprised that instruments of this form have not come into ordinary use long ere this. Apart altogether from its capability of form-

ing part of a syphon, when used alone without the flexible tube, the urine flows from it into the receiving vessel so much more conveniently than from catheters of the ordinary shape, that I should now be sorry to return to the latter, which almost invariably soil the bedclothes of the patient and the hands of the surgeon. All that is necessary to convert this form of catheter into a syphon, is to slip on to it the end of an indiarubber tube. Such a tube as is attached to a ball-pessary answers well. The tube must be considerably longer than the catheter, in order that it may form the long leg, and the catheter the short leg, of the syphon. When, therefore, the catheter with the tube thus attached to it is introduced into the bladder distended with urine, and the external end of the catheter is bent down towards the patient's bed, the first gush of urine fills both catheter and indiarubber tube, and flows out at the extremity of the latter. We may now allow the catheter to assume the position that the elasticity of the patient's tissues, uninterfered with, assigns to it. The external end of the catheter will spring up, yet the urine will continue to flow; for the syphon having once commenced to act, the emptying of the bladder will go on until the whole of what it contains is drawn off. Since the longer the descending column of fluid is, the more satisfactorily does the syphon work, I have found it of advantage to carry the tube below the thigh of the patient, and allow the urine to run into a vessel standing at the side of, and at a lower level than, the bed. (Dr. R. Somerville, p. 235.)

DIABETES. — *Diabetes Insipidus*. — *Jaborandi*. — In a case of diabetes insipidus, the patient complaining of great thirst, and the skin being dry, jaborandi was ordered in the form of infusion of the strength of one drachm of the leaves and twigs to six ounces of water; of this a dessertspoonful was taken every four hours. On Feb. 28th a tablespoonful of the infusion was given every three hours; on March 1st a tablespoonful every two hours; March 4th, two tablespoonfuls every hour. On March 5th the skin of the back, abdomen, and inner aspect of the thighs was found to be perspiring pretty freely. On the 6th (the jaborandi being continued as when last mentioned) the skin of the arms and of the left palm perspired. 15th: The quantity of urine has declined steadily from 300 oz. on Feb. 26th to 236 oz. on March 14th. 31st: The treatment with the jaborandi having been continued, the quantity of urine passed to-day was 180 oz. The patient has found his mouth uneasy several times, and the amount of the infusion to be taken (varying from one to two

tablespoonfuls every hour) is left to his own sense of comfort or discomfort. His skin is moist, and he declares himself much easier and better in all respects, but still has "some of the old burning feeling in the throat and gullet." April 2nd: The sense of discomfort in the mouth amounts to-day to pain in the teeth and some slight difficulty in opening the mouth. He is ordered to take the jaborandi less frequently. The quantity of urine continued to diminish steadily till the middle of May, when it amounted to 120 oz. per diem. (Dr. T. Laycock, p. 99.)

Diabetes Mellitus.—A case was considerably benefited, in addition to ordinary treatment, by breathing nothing but warm air. Use a respirator and a knitted woollen cloth over both respirator and nostrils, and always keep the mouth closed as much as possible. (Dr. Charteris, *Lancet*, Nov. 6, p. 658.)

Dr. Donkin holds that experience has fully demonstrated that against the disease itself our only resource is *dietetic* treatment; that by this means alone we can expect either to arrest its progress entirely, or mitigate its severity. He does not wish it to be inferred that medicinal treatment is useless, or unnecessary, for the various complications which may arise during the progress of the disease. In considering the dietetic treatment of diabetes, he excludes all simple cases of glycosuria, whether permanent or intermittent, from deficient assimilation of starch and sugar occurring in subjects at an advanced period of life, and laments that the plan of treatment he advocates is too often brought into disrepute by the careless, slovenly, and imperfect manner in which it is applied. His rules for employing the skim-milk treatment are that the skim-milk *regimen must be exclusive*; that the quantity of skim-milk—*properly prepared by the careful removal of the cream*—beginning with four, five, or six pints on the first day, must be increased more or less gradually, according to circumstances; to eight, nine, ten, eleven, or twelve pints in the twenty-four hours, according to the age, sex, size, and condition of the patient. No rule as to quantity can be laid down to suit individual cases; it must be regulated to suit the requirements of each, *but in no instance should it exceed twelve pints*. Not more than seven or eight pints ~~should~~ be taken in the natural fluid condition. When a larger quantity is necessary, the surplus should be made into curd by the essence of rennet, and taken at separate meals. The skim-milk may be taken cold, or warmed to a temperature of 100° or so, but it must not be boiled, because a temperature of 212° alters the physical properties of casein, and greatly impairs its therapeutic properties. The specific

gravity of the skim-milk used should never be below 1035 ; that of the best quality is 1040. The daily allowance must be divided into regular meals. The constipation which this diet generally produces must be carefully remedied by the frequent administration of castor-oil, or of some mild saline aperient. The author does not parade this method of treatment as a panacea ; his experience of it has led him to the conclusion that if there is no progressive reduction of the specific gravity of the urine and of the sugar it contains after the expiration of a week (all rules having been strictly observed), little or no good will be produced by the treatment, which may then be discontinued. (Dr. A. S. Donkin, Dublin Journal of Medical Science, Nov., p. 421.)

STRICTURE OF THE URETHRA.—*External and Internal Division.*—

Prof. Otis, having a case of stricture complicated with fistulous openings to treat, first incised the perineum, and opened the urethra externally to a slight extent, and then introduced a urethrotome, and freely divided all strictured portions of the canal. Taking a lesson from this case of Prof. Otis, I operated on my case in the following way: Having passed a No. 2 silver catheter through the strictures into the bladder, I made a free incision in the middle line of the perineum, through the thickened tissues, and opened into the urethra immediately behind the point of the posterior stricture. I made no attempt to divide the stricture by this external incision, but, having removed the catheter, I introduced along the urethra into the bladder the fine grooved staff of a urethrotome (one after Maisonneuve's principle), and then, by passing the knife of this instrument along the whole length of its groove, the entire strictured portions of the canal were thoroughly divided. The whole operation did not occupy more than a few minutes, and I was much impressed with the advantages as regards easy and quick performance over the method of external division as usually followed. A No. 12 catheter was readily passed into the bladder after the operation, and was retained there for twenty-four hours. The patient's progress after the operation was in every way satisfactory. (Mr. T. Annandale, p. 220.)

Dr. Otis' Method of Treating Stricture of the Urethra by Division.—The method of Dr. Otis is based on the simple proposition "that in all contractions of the urethra the contractile points must be reduced to the normal calibre of the urethra in its healthy state." This applies to all deviations, and, in Dr. Otis' view, especially to "comparatively slight contractions." The surgeon must begin by ascertain-

ing the normal calibre of the individual urethra. This ascertained, we have various methods of "sundering" the stricture at some point. The selection must rest on the judgment of the operator; but whatever method may be selected—whether rupture, dilatation, or division—*every* fibre of the constricting tissue must be completely severed, or subsequent recontraction is certain. To ensure the attainment of these objects, Dr. Otis has devised a new form of urethrotome, which combines dilatation with division, though the object of dilatation is chiefly to enable us to apply the edge of the blade more surely to the structures which we intend to divide, and thus to protect, or nearly so, the healthy portions of the canal. All the bands which obstruct the canal must be divided one after another, if not detected at first. Dr. Otis never practises dilatation after the healing of the wound made during the operation. The incision is along the superior wall of the canal, against which the dilating portion of the instrument forcibly presses the blade. The use of the sound after the operation is simply to separate the divided surfaces, not to dilate. The after-treatment consists merely in separating the wound throughout its extent by the easy passage of a full-sized steel sound daily, or every other day, until healing is complete. If recontraction occurs after the operation, it is simply owing to incomplete division. (Mr. W. Coulson, p. 225.)

Impassable Stricture.—By this is meant a stricture where no instrument can be passed with any ordinary efforts, yet in which the patient may be able to pass water in a materially diminished stream, or guttatum. In the first instance I take bearings, passing down as far as I can, but in the gentlest manner, a large-sized instrument, and on its passage being arrested, I learn the site of the stricture—an important item of information, and one that generally will enable the experienced surgeon to predicate with tolerable accuracy whether he will have more than one stricture to cope with. Having learned so much, I now take a much smaller instrument, and upon failing to pass it, I have recourse to the smallest size in my armamentarium, and if, after repeated but most gentle efforts, I fail in introducing it, I desist for that day, making my patient take for fifteen or twenty minutes a warm bath, and ordering for him an anodyne draught to be taken on going to bed. Here I would wish to pause for one moment to dwell upon the importance of extreme gentleness in the management of such cases. Nothing is to be gained by force. The instrument should, as it were, be coaxed, not driven, through the stricture. When dwelling on the import-

ance of gentleness in our efforts to pass an instrument, Civiale says that it should be "swallowed" by the urethra, in using which expression he unwittingly foreshadowed that which I have since demonstrated—that the vermicular action of the urethra is towards, not from, the bladder. Should the slightest appearance of blood present itself I invariably desist for that day from my efforts to pass an instrument. Next day, if circumstances permit of it, I see my patient in bed, and I proceed as follows: I pass down to the stricture a fine catgut bougie, and when its course is arrested I commence to rotate it, always in that direction which will not unravel the gut, and after doing so some five or six times, I pull gently, very gently, on the catgut, and if it has wormed its way, be it ever so short a distance, into the stricture, it will give a sensation to the operator's hand of being gripped—held fast—by the stricture, a sensation which, when once experienced by the surgeon, can never afterwards be mistaken. Having felt this, I recommence the rotation of the catgut, and if the stricture be a short one, I worm its way on into the bladder, where I leave it for a few hours, and then withdraw it, again ordering my patient, as before, the warm bath and anodyne draught. The surgeon who employs this plan of treatment for the first time, on proceeding to withdraw the catgut, will be surprised at the amount of force he will have to use to overcome the tenacity of the grip with which the stricture holds the catgut, the latter having swollen considerably whilst lying in the moist warm urethra. After a few days of such treatment I experience no difficulty in introducing a small-sized catheter into the bladder, which I frequently leave in for a night, and thus the urethra will be sufficiently enlarged to admit of any form of instrument the surgeon may wish to employ for the purpose of completing the treatment on the "immediate plan." (Dr. R. Macnamara, p. 283.)

Impermeable Stricture.—Whenever I find that previous abortive efforts have been made to pass an instrument, I never commence the treatment by trying to pass an instrument, but proceed as follows: I administer to the patient at once in a tablespoonful of water fifteen minims of a mixture composed of one part of the liquor morphiæ hydrochloratis (B.P.) and two parts of the tinctura ferri perchloridi (B.P.), and this I repeat every ten minutes until I succeed in my further efforts. As soon as I can I have him placed in a warm bath, the temperature of which, at first 98° of Fahrenheit's thermometer, is raised to 100°; and when he has been in this bath about fifteen minutes or so, by which time he will probably have

taken his third or fourth dose of the mixture, I in the gentlest manner possible steal into his bladder a soft No. 2 (Weiss's gauge) gum elastic catheter, and once it has reached the bladder I take good care to leave it there until the following day. I know that, as a Professor of Materia Medica, I should be ashamed of the combination I have just suggested; but from repeated experience I also know its practical value. Proceeding after this fashion, I have never yet failed to relieve my patient, and it is a remarkable fact for a surgeon to a large metropolitan hospital to have to state, but nevertheless still a fact, that I have never yet seen the bladder tapped but on one occasion, and then I myself performed the operation. (Dr. R. Macnamara, p. 232.)

URETHROTOMY.—*New Urethrotome*.—For this operation an improved instrument has been made for Dr. Watson by Mr. Young, of Edinburgh. It consists essentially of a Syme's stricture staff, from which a tenotomy blade is made to protrude at an angle on turning from left to right a wheel fixed at the proximal extremity of the instrument. This instrument is probe-pointed at the distal extremity, and the size of a No. 10 or 12 at the haft. The instrument gradually increases for four inches from the fine probe-pointed extremity, up to the size of a No. 2 bougie. Here it abruptly enlarges to the size of a No. 12. At this point, where the thick and thin portions of the instrument are continuous, a tenotomy knife-blade, concealed in a groove in the slender part of the shaft, is so pivoted that it can be projected at an angle with the commencement of the thick portion of the staff. The degree of angular projection of the knife is determined by the number of turns given to the screw attached to the handle of the instrument, and this degree of protrusion is marked by an indicator on the shaft. For the purpose of cleansing the instrument after use, the blade can be screwed out to a right angle to the shaft; but in use, when dividing a stricture, no protrusion beyond an angle of 45° is required. The instrument in all its parts, except the blade, is nickelised to prevent rusting. When employed the instrument is introduced with the blade enclosed in its groove. When the pointed extremity has been insinuated through the strictured part of the canal, it glides smoothly onwards towards the bladder, till the anterior extremity of the stricture arrests the progress of the thick portion of the staff. The anterior extremity of the stricture is thus determined with absolute precision, and as few strictures exceed an inch and a half in length, the blade is sufficiently long to secure the division of the stricture with one movement of withdrawal of

the whole instrument. When once the instrument has been lodged in close contact with the stricture, the screw in the handle is turned so as to secure a protrusion of the blade to an angle of 30° , the whole instrument is then drawn forward as if to withdraw it from the canal. When this is at first attempted it is felt to be firmly held, then the tissues yield. When the instrument has been withdrawn about two inches from the urethra, the screw is inverted, causing the blade to retreat completely into its groove, and the passage of the whole instrument onward towards the bladder is once more attempted. In most instances this is found unopposed. And if it be so, the urethrotome is withdrawn, and a full-sized catheter passed to empty the bladder. Should the passage onwards of the thick portion of the instrument be opposed, either another stricture or some portion of the same stricture is shown to be undivided. A reprotrusion of the blade, and repetition of the movement of withdrawal, will secure the division of this obstruction, and similarly of any other constriction which may still oppose the passage of the full-sized portion of the stem of the instrument. (Dr. P. H. Watson, p. 217.)

VARICOCELE.—*Operation by Subcutaneous Wire-loop.*—First, it is most important that the vas deferens and spermatic artery be separated from the veins. This is best done by the surgeon standing on the patient's left (supposing the disease to be on that side), and taking that half of the scrotum, about an inch above the testicle, between the left finger and thumb, and feeling for the duct by rubbing the two surfaces of the bag gently together while its walls glide from his grip. When he has thus brought the duct and artery from among the venous plexus and holds them between his thumb and finger-tip, he must let them slip away to the back, so that he will enclose the veins within the circle of his finger and thumb and exclude from it the artery and the vas deferens. The digit tips and slightly compressed scrotum will separate the one set of vessels from the other. If, in seeking for the duct, the surgeon have allowed a few veins to slip away with it, he can begin again, with the advantage of having no longer the whole mass, but only a few vessels, to deal with. If he be not sure of having successfully isolated this important part, he must examine the condition of things with his right hand while keeping the left in the same position. Supposing this separation accomplished, the bit of scrotum between the finger tips is to be squeezed rather tight, and a needle, armed with iron or silver wire, not too fine, thrust straight through above them. Now the part may be released from grasp, and

the needle passed in again at the puncture of exit, in front of the veins, and out at the first place of entrance. Thus at one opening protrude the two ends of the wire, and at the other a loop; by drawing on the ends the loop is pulled into the scrotal cavity, and closely surrounds the varicocele. Each end is passed through a hole in the little instrument I depicted in my former paper, and drawn tight enough to make the veins below swell, bulge, and partly consolidate. Every other day, or every day if time be an object, the wire may be tightened until it has cut through all the consolidated veins, and has come away. No suppuration nor apparent inflammation accompanies the process. The patient need not be confined to his bed after the first forty-eight hours. One caution must be given. In passing the needle the second time—*i.e.*, in front of the veins—its course must be entirely in the cavity of the scrotum. If, from over-anxiety to include every vein, or from other cause, some of the lining fascia be strangulated in the loop, the case will be considerably retarded, and some amount of suppuration, accompanied by swelling in the walls of the sac, is likely to ensue. The operation, well performed, is very slightly painful. (Mr. R. Barwell, p. 214.)

AMPUTATIONS, FRACTURES, AND AFFECTIONS OF THE BONES AND JOINTS.

ANCHYLOSIS OF THE ELBOW-JOINT FROM INJURY.—There is a method of excision of the condyloid head of the humerus for the cure of ankylosis of the elbow-joint which is worth consideration. It was proposed by Dr. P. H. Watson, of Edinburgh. It consists essentially in resecting and removing the condyloid end of the humerus without cutting the attachment of the triceps to the olecranon, or that of the brachialis anticus to the coronoid process—in fact, without removing any part of the articular surfaces of the ulna or radius. By this method the natural movements of the elbow are preserved, and the tendency to recurrence of the ankylosis is prevented. (Prof. Spence, *Medical Times and Gazette*, Aug. 21, p. 207.)

ANTISEPTIC SURGERY.—Paradoxical as it may at first appear, with antiseptic treatment the more free the wound, and the more widely it gapes, the more certain you are to avoid inflammatory disturbance in the joint; simply for this reason, that you are the more certain of a free discharge of the plasma effused into the interior. The antiseptic will not be introduced into the joint; it will not be applied to the affected part

at all. It will be merely employed externally to prevent the access of septic mischief while we provide exit for fluid from the interior. We shall first purify the skin with a strong (1 to 20) watery solution of carbolic acid, which is best for detergent purposes; water holding carbolic acid but slightly, and very readily giving it up to act upon anything else. Carbolic acid has a remarkable penetrating property. It blends with oily substances and animal matters, and penetrates the hair and hair-follicles, and therefore such a washing as I am now giving will render the skin absolutely pure, surgically speaking. This is a very great point. In the next place, we shall have an antiseptic atmosphere provided by means of this spray-producer, which acts on the principle of Siegle's steam inhaler. High-pressure steam, issuing by a minute orifice from a boiler heated by spirit-lamp or gas, sucks up a strong solution of carbolic acid by a tube that dips into a vessel containing it, and, blending with it in about equal quantity, forms a 1 to 40 spray. [Mr. Lister then proceeded to perform the operation. Some small arteries, which bled in the incision, were secured with fine prepared catgut, and the joint having been opened, two drainage-tubes, each about $\frac{1}{4}$ inch in diameter, were inserted side by side; an obstructing band within the articulation being divided by a probe-pointed knife guided by the finger so as to permit them to be introduced fairly into the cavity. He commented on the various steps as he proceeded, urging again the absolute necessity of having all the instruments thoroughly aseptic.] The operation having now been performed, the next point is so to dress the wound as to make sure that nothing septic will get in before next dressing; this must be not a matter of hope but of certainty. The material which we have used for some time past is an open cotton cloth, with the fibres impregnated with a mixture of carbolic acid and common resin. Common resin holds carbolic acid with extreme tenacity, and in consequence of this gives it off so slowly as to be unirritating to the skin; yet at the temperature of the human body it furnishes a sufficient supply of the acid for a trustworthy antiseptic dressing. But at the ordinary temperature of the air in this country, the antiseptic is evolved so slowly from the gauze that the fermentative energy of septic dust is not at once extinguished by falling upon it, as it is by mingling with a strong watery solution; and if the gauze were applied dry, some active septic particle, adhering to its surface, might enter the blood or serum at the outlet of the wound, and propagate putrefaction to the interior. A small piece of gauze dipped in the lotion having been placed next the wound, the dressing on which we rely for excluding putrefaction is applied in the

form of eight layers of the gauze, sufficiently broad, as you see to cover the surrounding skin for several inches in every direction; and beneath the outermost layer is placed this piece of thin Mackintosh cloth to prevent the discharge from going directly through the dressing; because, if a considerable quantity went through, strongly as the resin holds carbolic acid, it might be all washed out before twenty-four hours had elapsed, and then putrefaction would spread inwards to the wound. The dressing is secured by a bandage, for which strips of the antiseptic gauze prove very convenient. (Prof. Lister, p. 117.)

Boracic Acid in Antiseptic Surgery.—The use of boracic acid as an antiseptic was first brought under notice by the sale of a powder and liquid in Sweden for the preservation of articles of food, and as an application to wounds. The active principle was discovered to be boracic acid. Boracic acid was then little more than a chemical curiosity. But I succeeded in obtaining in Edinburgh a sufficient quantity to enable me to test its properties unmixed with other ingredients. A striking instance of its antiseptic efficacy as well as of its therapeutic value was at once presented by a case of pruritus ani of upwards of ten years' standing. The affected part was washed with a saturated watery solution at bedtime, and a small piece of lint soaked with the same lotion was applied and retained during the night. The result was immediate relief from the accustomed irritation, and, what struck me as extremely remarkable, the bit of lint when removed next morning, was free from smell. It was afterwards found that even the slight mechanical irritation caused by the presence of the lint might be avoided; for the mere application of a few drops of the watery solution last thing at night, the part being left moist with the liquid, proved completely efficacious; and this simple treatment being continued for a while, the obstinate tendency to irritation gradually disappeared, while the thickening of the folds of skin, which had been of several years' duration, entirely subsided. Another example of the usefulness of the new remedy was furnished about the same time by a case of inveterate eczema of the ankles in a lady above the middle period of life. The water dressing which she used being removed, a very unusually fetid odour was exhaled from the moist scarlet surface which, tender as it was, she was impelled to scratch by an intolerable sense of itching. Thinking that here, as in the case of pruritus, the irritation caused by putrefaction might be a main element in the obstinacy and discomfort of the complaint, I gave the boracic

acid a trial, substituting a saturated watery solution for the water in the dressing previously employed. The effect was at once to correct the fetor, but in this case the application occasioned a good deal of persistent uneasiness in the sensitive surface. The patient, however, persevered with the treatment, and in a short time the ankles were both in a sound condition, which I was lately glad to learn had proved permanent. In order to be of use in antiseptic surgery lint soaked in a watery solution would not do. The antiseptic must be stored up in the lint if its power is to be anything but very temporary. This may be managed by soaking lint in a hot saturated solution of the acid and allowing it to dry, when it will be found to weigh about double its former weight, and to be full of the soft unctuous crystals of the acid. The boracic lint has proved very valuable in the treatment of ulcers of the legs or elsewhere. In dealing with them, the first step is to cleanse the sore and the surrounding skin once for all from septic impurity. This is done by treating the surface of the sore freely with a solution of chloride of zinc (forty grains to the ounce), and at the same time washing the integument with a strong watery solution of carbolic acid, which is used on account of its remarkable power of penetrating the epidermis, while for the sore itself the solution of the chloride appears to be more efficient. This preliminary step having been taken, the boracic dressing is at once employed as follows:—A piece of oiled silk protective, of sufficient size to cover the sore and slightly overlap the surrounding skin, is dipped in the boracic lotion (a saturated watery solution) and applied, and over this a piece of boracic lint large enough to extend for an inch or more beyond the protective on all sides, the whole being retained in position with a bandage. It is well to soak the boracic lint with the lotion before putting it on, not for the sake of adding more of the acid, but because the lint, when applied moist and allowed to dry on, is less liable to slip afterwards from its position, and also for the purpose of purifying the surface of the lint itself, which in the dry state has no power of acting upon septic dust adhering to it, the acid which it contains being non-volatile, and, therefore, only acting when in solution. (Prof. J. Lister, p. 107.)

Boracic Acid Ointment.—Boracic acid may be sometimes used with advantage in the form of an ointment, for which I would advise the following mode of preparation:—Take of boracic acid, finely levigated, one part; white wax, one part; paraffin, two parts; almond oil, two parts. Melt the wax and paraffin by heating them with the oil, and stir the mix-

ture briskly along with the boracic acid powder in a warm mortar till the mass thickens. Then set it aside to cool, after which it will be found to be a pretty firm solid mass, which is to be reduced to the proper consistence of a uniform ointment by rubbing down successive portions of about an ounce each in a cold mortar. This ointment, when used, is spread very thin upon fine muslin or linen rag, which absorbs more or less of the almond oil and leaves a layer of blended wax and paraffin, flexible at the temperature of the body, and separable from the skin with the utmost ease by the discharge, which is thus not at all confined by it, but diffuses itself and flows out beneath it, receiving as it goes an abundant supply of the acid to prevent putrefaction, while cicatrization is not materially interfered with by the mild antiseptic, and still less by the perfectly bland wax and paraffin. (Prof. Lister, p. 115.)

BLOODLESS SURGERY.—In many cases of amputation, owing to the septic state of the tissues or the malignant nature of the disease for which we are operating, I consider it inadvisable to repress the blood and other fluids—such as unhealthy pus or cancer juices—into the parts above. In such cases, I draw a band of indiarubber tubing, pressing on the limb from above downwards, and tighten it immediately above the part to be removed. This, of course, saves no blood to the patient; but it renders the operation bloodless in another sense, and is especially useful in private practice, as avoiding soiling of the floor or furniture. In cases of excisions of joints, where the parts are loaded with pus, I constrict above and below the point to be operated on, and thus secure a nearly bloodless operation without risk of repressing the unhealthy fluids into the textures higher up. (Prof. J. Spence, p. 151.)

DIEFFENBACH'S OPERATION FOR UNUNITED FRACTURE DONE SUBCUTANEOUSLY.—Dieffenbach's method can be done subcutaneously, thereby avoiding the tedium, trouble, and danger of a large and deep wound. The necessary tools are an Archimedian drill-stock, a steel drill four or five inches long, and a few ivory stilettes of the same length and diameter (or slightly tapering) as the drill. The drill and stilettes are similarly graduated in half-inches, and the ivories are, moreover, grooved like a director, in order to slide along the drill. The *modus operandi* consists in entering the drill through a puncture made by a tenotome down to the bone; the depth of the soft parts is now read off by means of the graduations, then if it be desired to bore into the bone to the depth of an inch, the drilling is proceeded with until the

steel has penetrated an inch further than the original reading. The ivory stilette is now *filed half-way through* an inch from the point, and after being soaked in carbolic oil is guided by its groove down along the drill to the brink of the perforation in the bone, from out of which the steel is next lifted, the ivory slipped into its place, hammered, and by a smart lateral motion broken off at the filed notch. The operation is completed by withdrawing the remainder of the stilette and sealing the puncture with a bit of lint and plaster. Thus an inch peg is accurately placed in an inch hole, leaving no portion projecting into or from the flesh. The graduations on the ivory are for the purpose of comparison with the depth indicated previously on the drill, and it should be observed that the readings tally before the stilette is broken off. The reason why the stilette is grooved instead of the drill is that when the peg is driven home a channel is thus provided for the escape of inflammatory fluids, which would otherwise be pent up in the bone. By the means first detailed three pegs were successfully inserted around the fracture—one in the upper and two in the lower fragment; the punctures healed kindly in twenty-four hours without the development of pus or any constitutional disturbance; even the local irritation was far less than expected or desired. Whether the result to the patient be successful or not, the practicability of subcutaneous pegging has been safely demonstrated. (Dr. M. Hill, p. 130.)

EXCISION OF THE ELBOW-JOINT.—Mr. Maunder's plan seems an excellent one. He describes it as follows:—I performed excision on a method which I suggested to the profession as a *certain* means of securing active extension by the triceps—a desideratum hitherto only rarely, and then accidentally, attained. Briefly put, my object is arrived at by avoiding all transverse section of the soft parts lying between the point of the olecranon and the external condyle of the humerus. In this way the continuity of muscular and aponeurotic structures passing from the arm to the forearm is not destroyed. (Mr. C. F. Maunder, *Lancet*, Nov. 15, p. 695.)

FISTULOUS SINUSES.—*Elastic Ligature.*—Ligatures of thread for a great many years, even, we may say, from the time of Ambrose Paré, have been employed for cutting through certain structures, mainly arteries; but hemorrhoids, nævi, warty and pedunculated growths have constantly been removed by the application of a ligature, and the reason it has not been more extensively available has arisen from the fact that only a comparatively limited thickness of tissue can be

cut through by *one* application of the ligature, which, as suppuration takes place, becomes loose, and then does not penetrate further unless it be retightened; it is only therefore small and soft growths that can be safely and advantageously treated by the thread ligature. To all these methods there is some objection, either severe pain is caused, or the ligature has to be constantly retightened. In my experience, now, I do not think it necessary, or even desirable, in ordinary tissues, to fix the ligature so tightly around the part to be severed as I formerly did. I believe a slighter equable pressure will effect safely and more painlessly all we require. In fact, the elastic ligature does not so much cut as gradually compress and render dense the part contained within the loop, and this is how its action differs from inelastic ligatures—ulceration taking place on both sides of the loop, so that when the ligature comes away, actually a portion of the tissue is found contained in it; so hard, dense, and semi-transparent is this as to resemble horn. In my earlier operations I used a small drainage-tube, tied in a reef knot, as recommended by Prof. Dittel; this does not answer so well as the solid india-rubber used by Sir Henry Thompson, and I never now tie a knot, as the knotting very easily breaks the india-rubber; but I adopt a plan I will presently describe. In my early cases, when employing the drainage-tubing, I twice had to tighten the ligature, as I thought it was not exercising sufficient pressure; but I now know this need scarcely ever be done if the ligature be properly adjusted at first. I have now used the elastic ligature in 40 cases of fistula-in-ano, five of hemorrhoids, two of sinus in the groin and one in the neck, two removals of scirrhus breasts, two cases of pedunculated tumours, two cases of varicocele, also in cases of varicose veins, division of the sphincter ani, linear rectotomy, and nævus. (Mr. W. Allingham, p. 144.)

FRACTURES OF THE LOWER EXTREMITIES.—*Extension Pulleys.*—Having to treat a compound fracture of the thigh where the wound was so placed that even the bracketed long splint could not be used, I tried the extension pulleys, and found that method so effective, that I tried it in ordinary cases, and have found it so simple and effective, so much more comfortable for both patient and surgeon, that I now rarely use the long splint—almost never, except for clinical instruction, that students may see more than one method of treatment. Now, after some years' experience in the use of the extension pulleys in fractures of the thigh in very young children and in adults, in fracture of the neck of the femur in old persons, and in long oblique fractures of the tibia, I unhesitatingly

commend the method to all who may not have tried it. Of course, in fractures of the shaft of the femur, lateral splints are required, just as when we use the long splint, and also for lateral support in fractures of the leg. When there is much bruising, however, I merely use sand-bags to prevent lateral displacement; and I also prefer deep sand-bags to prevent rolling of the limb outwards in fractures of the thigh, to a long lateral splint, as used in America. In fact, the full advantages of the extension pulley method are only secured when we abandon the perineal *lacque* and long lateral splint, and make the body the counter-extending force. (Prof. J. Spence, p. 129.)

KNOCK-KNEE.—*New Operation for certain cases of.*—In a case of aggravated knock-knee from a curve inwards of the lower end of the femur, there seemed two courses open in order to put the limb into a straight position. These were to take out a wedge-shaped piece of bone from the shaft of the femur, at the point of flexion, or to take off an oblique slice of the condyles, principally of the inner condyle. The latter operation was determined upon. An incision, about five inches in length, was made along the inner aspect of the knee-joint, the articulation opened into, the internal lateral ligament cut across, and the patella and its ligament being drawn outwards, the crucial and external lateral ligaments were also divided. An oblique slice was then sawn off from the condyles of the femur, the tibia not being interfered with. After the removal of this slice of bone, the leg was readily brought into a straight line with the thigh; and a drainage tube being inserted into the cavity of the joint, a few sutures were applied, and the limb placed on a wire splint, in the straight position. The whole operation was performed under the antiseptic spray, and the usual antiseptic dressing was applied to the wound. Nothing could go on more favourably, as very little suppuration took place and the wound became soundly healed. Ultimately the only imperfection of the limb was a want of mobility of the joint, but this was to a great extent overcome by forcibly flexing it under chloroform. I am not aware that this or any similar operation has been before practised in cases of knock-knee, but the successful result obtained in the case reported, encourages me to recommend this method of operating in certain aggravated cases of the deformity which have resisted the division of the biceps tendons, or other tense structures, and carefully-applied mechanical treatment. (Mr. T. Annandale, p. 133.)

OPERATION UNDER CHLORAL HYDRATE.—The authors record the case of a delicate-looking female child, three years old, which was put under the influence of chloral, and the third metatarsal bone of her left foot removed for disease. An aqueous solution of chloral was prepared, of which 20 minims contained 12 grains, and they had also at hand a solution of strychnia of 2 grains to the ounce. At 10.30 10 minims were injected subcutaneously into the right lower leg; the child cried continuously for some minutes. At 10.40 10 minims more were injected, and the child given to its mother to carry about. 10.45 drowsy, but easily roused; starts and cries suddenly, and as suddenly ceases. 10.55 10 minims more injected into the left lower leg; sleeps quite soundly; no flushing of face; wakes in a moment, and is asleep again in a moment. 11.5, 10 minims administered by the mouth; begins to snore; pinching makes her cry, but she sleeps immediately. 11.15, 10 minims more administered by the mouth. 11.20, seems now in a deep sleep; pinching does not awake her. The operation was now performed. During its performance she began to cry, but made no struggling. The eyes remained nearly shut, and the crying seemed like that of a dreaming child. She ceased crying immediately the operation was done, and was fast asleep in a moment. She was allowed to sleep for two hours. Strong tea was then prepared, of which she was made to drink a cupful, and in another three quarters of an hour she sat up, dazed-looking, but quite unterrified, and apparently oblivious of any pain. The solution of chloral was too concentrated, and made deep wounds afterwards, which, however, healed up well enough. (Mr. G. J. S. and Dr. A. Nairne, p. 132.)

AFFECTIONS OF THE SKIN, ETC.

INDOLENT ENLARGEMENTS OF THE CERVICAL GLANDS.—*Hypodermic Treatment*.—In carrying out hypodermic treatment the cure may be effected either by resolution or by destruction. In the former case absorption takes place; in the latter the injection is followed sooner or latter by suppuration. It is desirable, if possible, to cure by resolution. I have found acetic acid, as recommended by Dr. Broadbent for the treatment of certain kinds of cancer, the most useful remedy for this purpose. With this agent I have treated twenty-seven cases; of these fifteen were completely cured by resolution, four were greatly benefited, in five suppuration took place, and three patients discontinued treatment without any decided effect having been produced. I have used the ordinary

dilute acetic acid of the British Pharmacopœia, and have generally injected from five to twenty drops, according to the size of the gland to be treated, seven or eight drops being an average dose. The injection should not be made more than once a week. The fluid should be injected well into the middle of the gland. Suppuration has generally resulted from the solution having been injected either too frequently or too superficially. If suppuration take place the fluid should be drawn off with a hypodermic syringe or aspirator. The average duration of treatment by resolution is three months. (Dr. M. Mackenzie, p. 250.)

The best cases are those where a single cervical gland is hypertrophied in an otherwise healthy (adult) subject. Five or six injections of the simple tincture of iodine (five to ten minims at a time, according to the size of the tumour), at intervals of about four days, generally effect a cure. The earlier stages of strumous hypertrophies are also very successfully treated by this method, as are the small hard multiple lymphomata; but in the later stages of strumous disease of the cervical glands, where the tumour is broken down into a mass of caseous matter, and the neighbouring skin is blue and undermined, no good results follow from the injection of iodine; and, indeed, these cases are best treated by a careful excision of the disorganised and degenerated glands. I have also recently employed iodine injections in a large and hard fibroid bronchocele, which had been treated unsuccessfully by the internal administration of the drug. The tumour was not only inconvenient from its size, but had almost destroyed the voice, and so pressed on the trachea as to deflect it to the right side of the neck. The case is still under treatment, but the first two injections of ten minims of iodine were followed by the diminution of an inch in the girth of the neck. By parity of reasoning we may expect this method to prove serviceable in uterine myomata and allied growths. (Mr. S. M. Bradley, p. 252.)

PLASTIC OPERATIONS.—*New Method of Performing.*—Tagliacozzi recommended 300 years ago that the fresh material for repairing injuries or defects of the face should be taken from the arm. This however became gradually abandoned on account of the inconvenience of the posture required. As the result of experiments upon animals, it has been found that the isthmus of living tissue to connect the transplanted part with its original seat is not necessary, and this has been found to be also true in the human subject. This is however one condition—that the cellular tissue should be cleared away from the transplanted parts, as much as possible. The

following is an example, showing how this principle of action may be applied to the formation of a new eyelid. I formed a new lower eyelid in the following manner. The edges of the upper and lower eyelids having been vivified, I introduced three ligatures into the border of the lower eyelid, which I entrusted to my assistant. By means of these ligatures, he used traction, whilst I dissected the whole of the cicatricial tissue, and thus liberated the subjacent structure. The ligatures were then introduced into the upper eyelid, and the edges of the upper and lower eyelids were thus united. I then elevated the edges of the wound, preparing them to receive the new flap like a watch-glass. The skin required for the formation of this eyelid was two inches in length and one inch in breadth, which I took from the forearm. To test the principles above indicated, I divided my flap into three portions. The first I removed, along with the cellular tissue, as close to the dermis as compatible with the integrity of the flap. The other two portions, after removing them from the forearm, I turned up; and with a cataract-knife, I sliced off the areolar tissue, leaving a white surface, which I applied to the eyelid. The difference between these flaps was very remarkable. The two flaps, which were previously prepared, healed by agglutination, without exhibiting even the slightest tendency to desquamation of the cuticle. Twenty-four hours after the operation, the surfaces looked pale; but the next day the temperature was normal, and appearance healthy; whilst that part which was applied without previous preparation looked rather livid the first day, improved the next two days; the fourth day, it began slightly to suppurate; and, after a hard struggle for life, a portion of it only remained, while the rest shrank. This, however, will not compromise the result of the operation, which may be considered satisfactory. (Dr. J. R. Wolfe, p. 246.)

PORRIGO AND TINEA FAVOSA.—*Petroleum*.—Petroleum is a safe and simple remedy for the cure of paralytic cutaneous affections of the head. Having clipped, or better still, shaved the head, let poultices be applied a few times, then let the petroleum be applied twice daily in the form of one part petroleum to two of lard, and a few drops of oil of lavender. The ointment may be moderately warmed before application. After the application a piece of dry soft clean linen rag may be laid on—an old cambric handkerchief answers very well—and over all, a soft clean linen cap. Before the next application of the petroleum ointment, the head must be thoroughly but gently washed with black or fish soap and fresh warm soft

water. The ointment is then to be reapplied as before. Every rag or cap, once used and past further use, should be thrown into the fire, but if intended for further use, plunged in a hot soda ley, and after being well washed, finally rinsed in water containing a little carbolic acid. (Dr. H. Maccormac, p. 248.)

PSORIASIS.—*Tar Internally.*—I have come to regard tar in the light of one of the most valuable remedies we possess in the treatment of psoriasis. And it is not merely in mild cases that it does good, for it has, in my hands, frequently yielded the most satisfactory results in very obstinate cases after long courses of arsenic and many other orthodox remedies had been tried in vain. Perhaps it may be that the dose and mode of administration of the tar may have something to do with the difference in the results obtained by Mr. Squire and myself; and, therefore, it may be well to state that I generally begin with two minims three times a day in a teaspoonful of treacle, and gradually increase the dose, if necessary, to half a teaspoonsful, or even more. The small dose is advisable at first, as in some persons the medicine cannot be tolerated, and produces derangement of the digestive organs, fever, and a bright red rash upon the skin. I can testify also to the virtues of this remedy in catarrh of the bronchial tubes, as pointed out by Dr. Ringer, and in chronic affections of the mucous membranes generally; and I conclude with the remark that it is very singular how such a valuable remedy, which seems in earlier days to have been highly esteemed, should, as an internal medicine, have fallen into such disrepute in our own time. (Dr. T. M'Call Anderson, British Medical Journal, April 24, p. 537.)

AFFECTIONS OF THE EYE.

ARTIFICIAL MEMBRANA-TYMPANI.—There is much uncertainty in the use of the artificial membranæ-tympani invented respectively by Yearsley and Toynbee, sometimes one being found of service, and sometimes the other. The instrument to be described is a combination of the two. It is simply a combination of Toynbee's artificial membrane, viz., a thin disc of india-rubber mounted on a fine silver-wire stem, and Yearsley's cotton-wool. In my instrument, the wire is carried beyond the india-rubber for about a quarter of an inch, and terminates in a second disc, made of flannel. The space between the two is filled up with a small portion of Dr. von Bruns' wound-dressing cotton-wool, which is absorbent, and so takes up and communicates to the flannel disc any medicated solution which it may be desirable to

apply. To prevent overcharging the cotton-wool, a pipette should be used, as one or two drops are sufficient to moisten every fibre of the wool and flannel. (Mr. G. Field, p. 277.)

CATARACT WITH A DEEP-SET EYE.—When the eye is deep-set some embarrassment is occasioned in making the corneal section, especially where anæsthetics are not employed. In a case recently operated upon at the Birmingham Eye Hospital, I improvised a simple and effective method of overcoming the difficulty under consideration by making with a pair of sharp scissors a perpendicular incision through the substance of the lower lid of about three-eighths of an inch in length and one-sixth of an inch from the commissure. Steady continuous pressure by means of a small sponge restrained the bleeding within innocent limits. The front of the eye having been now made easy of access to the knife, the section of the cornea was completed without difficulty, and the lens safely delivered without accident. No anæsthetic was employed. The lid was not sutured, but dressed with cerate instead of dry rag, and two turns of a narrow domett roller. The patient, a collier of sixty-eight years, recovered without a single painful or unfavourable symptom, and was discharged cured on the fourteenth day of the operation, with a clear black pupil, good vision, and perfect cicatrisation of the tarsal cartilage. (Mr. J. V. Solomon, p. 276.)

LOCAL TREATMENT OF EYE DISEASES.—In diseased conditions, when the conjunctiva and cornea are roughened by the projection of distended blood-vessels, and when the natural secretions are altered or diminished, and especially when there is any abrasion or loss of the corneal surface, the friction of the lids becomes not only painful, but injurious, and the movements are at the same time increased in energy and frequency by reflected irritation. It then becomes necessary that they should be restrained; and for this purpose we employ what is known as a “compressive bandage.” There are many circumstances under which it is desirable to apply cold or heat to the eye; the former to moderate, the latter (as in the case of sloughing ulcers of the cornea) to promote vascular action. For these purposes we employ compresses of various kinds. In order, however, to obtain complete physiological rest to the eye, it is necessary to have resource to the use of atropine, which establishes complete internal passivity of the organ. For this purpose a solution of two grains to the ounce of distilled water is absolutely unirritating. If pain is produced by its use, the probability is that the drug is impure or not neutral. At hospitals we con-

constantly see children for whom atropine has been prescribed, but whose pupils are not dilated. Occasionally, perhaps, no one at home has taken any trouble about the matter; but more frequently, I believe, the drops have gone over the cheeks, or anywhere but into the eyes, or they have been applied so roughly as to produce plentiful crying. In hospital practice such children can be brought every day, so that the application may be made effectually; and it will often be desirable to use, instead of the solution, the little wafers of atropinised gelatine which were devised by Mr. Streatfeild. I do not like these wafers for common use, because they often produce too much smarting; but for crying children they have a great advantage in the fact that they dissolve slowly, and that the medicament is not liable to be at once washed away by a gush of tears. (Mr. R. B. Carter, p. 266.)

VENEREAL AFFECTIONS.

INHERITED SYPHILIS.—No one who has watched the effects of mercury given in cases of inherited syphilis ought to doubt the potency of at least that drug. We know few things in therapeutics more satisfactory than to witness the improvement of children thus treated; they rapidly fatten, lose their shrunken aspect, and change from little old men, to actual infants; the eruptions fade, the sores heal, and the progress is often astonishing. (Ed. of Brit. and For. Med.-Chir. Review, p. 283.)

SYPHILIS.—When the period of primary syphilis has long passed away, and when mercury has been given for a few weeks, it is very difficult to decide upon the course to be pursued. We have, then, two remedies between which to choose, mercury and iodide of potassium. Of these, iodide of potassium is the more rapid in its influence upon the symptoms actually present, but it probably possesses little or no power to modify the systemic malady. Nothing in clinical history is more remarkable than the rapid amelioration of the symptoms of late forms of syphilis under the use of the iodide; nothing is more certain, generally speaking, than their recurrence in the same or in some modified form. Mercury, on the other hand, will be slower in producing its first action, but more effectual as against the syphilitic taint; although it is not proven that syphilis of long standing can be cured by mercury, at least with anything like the same certainty as the earlier stages of the disease. In order to obtain a mercurial influence quickly, I use either blue pill, or inunction

with blue ointment, or both together; and, for prolonged administration, the perchloride. Inunction is often useful for adults, but its especial value is in the case of young infants suffering from a combination of purulent ophthalmia and inherited syphilis. For them, the plan I prefer is to smear every day a little fresh ointment on a strip of flannel, about an inch and a half wide, which is buttoned round the abdomen, next the skin, and worn constantly. Mr. Hutchinson is accustomed to have the ointment rubbed into the soles of the feet, the only part of an infant's skin on which it never produces irritation. The perchloride combines admirably with iron, or quinine, or arsenic, or with any two of them, and is generally more effective in combination than alone. Save in the exceptional cases of idiosyncrasy, in which mercurial poisoning may be produced by a single moderate dose, there should be no such thing as a sore mouth resulting from treatment. The slightest line upon the gums indicates a point beyond which the medicine should not be pushed: and the highest art of administering mercury is to keep the patient, as it were, on the brink of this line, without permitting transgression of it. (Mr. R. B. Carter, p. 161.)

Ricord's Treatment.—From the evidence gathered during an experience which is nearly as unparalleled in its duration as in its extent, he tells us that syphilis is radically and permanently curable, but that it cannot be cured, as a rule, otherwise than by a course of mercury continued, with due intermissions and precautions, for something like twelve months. Less than this will, indeed, in most cases, leave the patient apparently well, but the disease will again declare itself at some future time, and often in some of the obscure forms the nature of which we have only just learned to recognise. (Mr. R. B. Carter, p. 260.)

In all cases of syphilis in which you employ mercury, remember that you have two objects in view: the first, to cure the present symptoms; the second, to prevent a return of the disease. It seems to me that a great number of practitioners at the present day regard only the first object, and lose sight of the second. I have frequently seen a person who has taken mercury for a chancre, which has, perhaps, healed in a fortnight, and then has left it off, although a very hard cicatrix has been left. Under such circumstances, in nineteen cases out of twenty, there will be secondary symptoms. If mercury be taken for the primary symptoms, the patient should never leave it off till the hard cicatrix has disappeared, nor indeed for some time afterwards; and so, where it is given for secondary symptoms, it should be continued for a considerable time after they

have disappeared. A man has an eruption of the body ; it fades away, under the use of mercury, in the course of a month ; but the remedy must be used as a prophylactic for another month. If a patient be confined to his house, or only allowed to go out a little on a fine day ; if he be made properly to rub in the ointment, and the course be carefully watched and continued for some time after the symptoms have subsided, you will, I am satisfied, in the great majority of cases, make a real and permanent cure of the disease. (The late Sir B. Brodie, p. 293.)

The Relation of Soft Chancre to Syphilis.—Can a chancre which presented at one stage all the characters of a soft one subsequently become indurated? The soft sore results simply from pus-contagion, this pus being more or less peculiar, and its peculiarities being due to its having originated in syphilitic inflammation. I have insisted that this pus may or may not contain the germ-matter of syphilis. Let me here insist upon the extreme importance to the reputation of the practitioner of the rule never to give an opinion as to the nature of a chancre until the incubation period is over. Patients will come to you with sores contracted a few days or a week or two before, and will expect you to be able to tell them whether or not they are likely to have syphilis. Now, there is never anything in the conditions which are either present or absent which will justify the most practised observer in giving any opinion at such a stage. It is very rare indeed that an infecting sore acquires any induration within three weeks of the date of contagion, and more commonly it is a month or five weeks. Until such induration takes place, nobody can tell whether it is coming or not. Let your rule be, I repeat, to give to your patient no opinion whatever as to his chance of escape until he can assure you that it is one month since his last exposure to risk. If the virus be introduced in a pure, or almost pure, state, then it is probable that in many cases the patient experiences nothing excepting, perhaps for a few days, a little red pimple, which disappears, and leaves him, as he thinks, quite well for another three weeks or a month. At the end of that time the part begins to itch a little, and again becomes red, and gradually within a week or so a well-characterised induration is developed. If, however, the contagion have been effected by a mixture of contagious pus and specific virus, then you have a very different course of things. Within the first few days the contaminated part may inflame sharply, and an ulcer may result which will probably send the patient in great alarm to his surgeon. This sore is, of course, soft ; it secretes freely, and

its secretion may contaminate other parts, and you may have what are termed multiple soft chancres. You may inoculate it, if wished, on the patient's skin, and produce other similar sores, and thus prove that you have to do with a non-specific secretion. But all this does not prove that the specific poison is not there, and whatever may be the course of these soft sores, whether easy to heal or obstinate, there remains the risk that the specific induration may ultimately be developed. Probably the worse the sore, the more inflammation, and the deeper the ulceration, the greater is the patient's chance that the specific virus may be thrown off; whilst if the sore heals in a few days the danger of true syphilis is considerable. We often, from patients who are the subjects of tertiary disease, hear the statement that the original sore healed in a week, and gave scarcely any trouble. Such cases are, I suspect, examples of the early healing of a conspicuous soft sore, which was followed some weeks later by an inconspicuous and unobserved hard one. It is becoming increasingly the rule of English practice to give mercury as soon as ever specific induration can be recognised; but it is quite possible that we may, in the future, go further than this, and think that it is best to prescribe this remedy for all sores occurring within a month of contagion. We should no longer do so under the impression which formerly prevailed, that it was necessary in order to make the sore heal, for we now know that the soft sore is not syphilis, and cannot be influenced by its specific. The reason for giving it would be the fear that the patient may be passing unnoticed through the incubation stage of a true chancre. The soft sore proves that he has been contaminated with venereal pus, and shows that it is not improbable that he may have received the syphilitic virus also. It is quite possible that the antidotal efficacy of mercury may be much greater in the early stage than in the later ones. I wish, however, to have it distinctly understood for the present that I am merely suggesting, and not recommending. I am often pressed by patients to allow them to take mercury on speculation for soft sores, but hitherto have for the most part declined to do it; my reason being, that until some proof has been afforded that we have to deal with true syphilis, we have no data by which to determine the requisite length of treatment. (Mr. J. Hutchinson, p. 296.)

MIDWIFERY, ETC.

ADHERENT PLACENTA.—The *treatment* of adherent placenta should be prompt, because this complication is generally accompanied with hemorrhage, which may speedily become dangerous. It is never safe to leave such cases long to the unaided powers of nature, or to rely on ergot, styptics, or any kind of drug. The hand of the accoucheur supplies the only safe and effectual remedy. To employ this remedy properly, some coolness and dexterity and a considerable amount of patience are required. The hand has sometimes to be kept in the uterus for half an hour or more before the operation can be completed. In the ordinary obstetric position, the woman lying on her left side, the left hand will be found to be much the most convenient for this purpose; but, to perform the operation properly, both hands should be used. If the cord be tightly encircled by the os uteri, the constriction should be overcome by insinuating the tips of the fingers into the os in a conical form; whilst the right hand all this time is making counter-pressure upon the fundus uteri, so as to steady that organ. Should these precautions be neglected, the connections between the vagina and the uterus may be put very injuriously on the stretch, especially if the circular fibres of the os oppose much resistance to the introduction of the hand. As the tips of the fingers pass through the os, they should be gradually expanded and separated from one another, until, by sheer fatigue, they overcome the contraction of the uterine fibres, so as to allow the passage of the entire hand into the uterus. When this is accomplished, the next step is to pass up the hand sufficiently high to reach the placenta. The distance which it has to pass before this can be felt will depend very much upon the position of the placenta and the degree of contraction of the uterus. If the placenta be attached, as it usually is, to the fundus uteri, or if the uterus be in a flaccid condition, it will be necessary to pass the hand much further than when the placenta is attached lower down, or when the uterus is well contracted. I have sometimes had to pass the hand quite into the epigastric region in search of a retained placenta. As soon as the placenta is arrived at, the fingers should be spread out, taking care not to entangle them in the membranes, until the circumference of the placenta can be felt. If any portion of the circumference be already detached, the tips of the fingers should be cautiously inserted between this portion and the inner surface of the uterus, and the placenta gradually peeled off. All this time, the right hand, externally applied, steadies the portion of the uterus from which the left hand is detaching the placenta, and

enables the accoucheur to estimate the exact thickness of the uterine walls included between the hands, so that he can avoid digging his nails into the substance of the uterus. (Dr. J. G. Swayne, p. 326.)

DYSMENORRHŒA.—It very rarely indeed happens that any service is found to arise from operations on the uterus for the cure of dysmenorrhœa, while occasionally pelvic abscess and pelvic peritonitis have been known to result from such interference. There is still too great a tendency to expect to find an evident physical cause for all painful menstruation. Spasm and neuralgia are quite sufficient to account for the vast majority of cases. No doubt membranous shreds are frequent causes of obstruction to the menstrual flow. The rational treatment of dysmenorrhœa, commencing at an early period, consists in the use of cold baths in the morning with short walks in the open air afterwards; in hot baths a few days previously to the menstrual periods; and in palliative treatment of paroxysms at the time of occurrence. (Dr. C. R. Drysdale, p. 309.)

EPITHELIAL TUMOURS OF THE NECK OF THE UTERUS.—M. Labbé sums up the advantage of this method of treatment in the following propositions:—1. The removal of the tumour is so rapidly effected, the time not exceeding thirty to forty seconds, that chloroform is unnecessary. 2. Besides the rapidity with which the ablation is accomplished, the cut surface is so smooth and free from bleeding that there is little chance of secondary hemorrhage. 3. The platinum wire is so supple that it can be applied without any effort being made to drag down the uterus. 4. The mode of application of the wire requires no instruction. It is important, however, that when it has been made to glow by the passage of the current that it should be pressed well into the new growth to avoid injuring the healthy parts, and this he effects by a special apparatus with screw. As soon as the removal is effected a cold vaginal injection follows, and as a matter of precaution it is well to place a pledget of lint dipped in perchloride of iron on the wound. (Practitioner, Aug., 1875, p. 141.)

FIBROID TUMOUR.—*Disappearance of Fibroid Tumour during the Administration of Chloride of Ammonium.*—Dr. F. W. Hatch relates, in the Pacific Medical and Surgical Journal, the case of a woman aged 39 years, who had a tumour in the abdomen extending from the pelvis upwards and towards the left side, above the umbilicus, and who had neuralgia of the supra-orbital and temporal regions of one side. For the latter affection chloride of ammonium was given to the

extent of sixty to eighty grains daily, in divided doses. The relief to the neuralgia was very marked, and at the same time the abdominal tumour, which Dr. Hatch regarded as a uterine fibroid, diminished, and before the end of the year had disappeared. (Practitioner, May 1875, p. 366.)

IMPREGNATION, AND THE DISCHARGE OF OVA.—Dr. Williams has come to the conclusion that, in the great majority of cases, the discharge of ova takes place *before* the appearance of the menstrual flow with which it is connected; for in ten out of fourteen cases rupture of a follicle or hemorrhage into its cavity had occurred before the return of the catamenia; in one it was doubtful whether rupture of a follicle or the appearance of the discharge would have taken place first; in two a menstrual period had passed without the maturation of a follicle; and in one a periodical discharge was imminent, though the ovaries contained no matured Graafian follicle. (Dr. J. Williams, p. 307.)

INOCULATION WITH THE SEPTIC LOCHIA OF PUERPERAL WOMEN.—Dr. Stewart, of Barnsley, relates two cases of inoculation of wounds of the hand with the septic lochia of puerperal women. The first case resulted in gangrene of the hand and death. The woman from whom the inoculation was received was suffering from puerperal peritonitis. The second case recovered, but had suppuration in the cellular tissue of the hand and forearm which required free incisions. From these cases Mr. Stewart draws the conclusion that the passage of decomposing lochia over any abraded surface in the vaginal passage is sufficient to produce puerperal septicæmia without the importation of any other specific poison. In this manner, we may account for the disease attacking much more frequently primiparous cases, as the vagina and perineum are much more likely to be slightly lacerated in those than in multiparæ. (Dr. W. Stewart, p. 338.)

INSTRUMENT FOR REMOVAL OF GROWTHS FROM THE FEMALE URETHRA.—Messrs. Krohne and Sesemann have made under the direction of Mr. Thomas Bryant (Guy's Hospital) a simple instrument to facilitate the removal of growths from the female urethra by means of the galvanic cautery. The instrument is a dilator, speculum, and protector. As a dilator, it is readily introduced without any previous dilatation, when the patient is fully under the influence of an anæsthetic; and it can be rotated, and moved backwards and forwards. As a speculum, it allows inspection of every part of the canal, and exposes to view any growths (the growths falling into the slot of the instrument) which may be situated at the anterior or posterior part of the urethra. As a protector, it covers every

part of the canal with a non-conducting surface, leaving only the growths exposed; these can thus be readily removed with a platinum wire loop, or destroyed by a larger or smaller cautery, galvanic or otherwise. Mr. Bryant's dilators are made in sets of three different sizes, of boxwood and of ivory. They have been already freely used, and with marked success. (Obstetrical Journal, July, p. 247.)

PLACENTA PRÆVIA.—The plug is the treatment *par excellence*. It requires to be applied skilfully to be of any great use. Charpie or tow are the best materials with which to plug, and if properly applied, the author considers such a plug superior to any description of india-rubber bag which can be introduced into the uterus and inflated. The great point to attend to when plugging is to introduce enough of the charpie or tow, as much as a pound and a half of the former material being sometimes necessary. The bladder and rectum should both be emptied before we proceed to plug. Some practitioners dip the first pledget in a solution of perchloride of iron. This is not necessary. The charpie should be rolled into small balls, the first twenty or thirty of which should have a piece of thread attached. Before being introduced they should be well covered with cerate. This renders a speculum unnecessary. It is most important to pack tightly the anterior and posterior cul de sac, but especially the latter. The vagina should be filled until the material appears externally. Over this three or four compresses should be applied and the whole fixed by a T bandage. The plug should be left in from 12 to 24 hours. (Dr. Charpentier, p. 325.)

PROLAPSE OF THE UMBILICAL CORD.—*Postural Treatment*.—Place the patient in the knee elbow position, and, the hand being passed partially or completely into the vagina, just as a pain is coming on push up the loop of cord alongside of the head. As the head is forced down the cord will disappear, and will generally not again prolapse. (Dr. J. Brunton, p. 310.)

PUERPERAL FEVER.—Undoubtedly many cases of puerperal fever are induced by poison introduced from without, either pyæmic, scarlatinal, or erysipeloid, but another class of cases have an autogenetic origin. For example, you see a woman in the country away from all sources of infection; a little bit of the placenta is retained, a clot of blood is there, or some change takes place in the uterus, and there is an element of infection; it runs along the veins or the lymphatics, is absorbed by the mucous membrane; then you

get the blood tainted, and the slightest matter will set it going; the whole system is in a ferment, just as it was from the poison of scarlet fever or typhoid; you may call it pyæmia or septicæmia, the result is about the same. These cases come on a little later than those which have a zymotic origin, and they can often be arrested by washing out the uterus, and bringing away any superfluous matter there. (Dr. R. Barnes, p. 330.)

It is my impression, from all that I have seen, that the manner in which this communication takes place is, in a large proportion of cases, by means of the hand, and I believe that the spaces beneath the nails, and under the skin which cover the nails, are exceedingly liable to harbour these animal destructive products; I do not say that they are limited to those parts; the skin of the fingers may also be their habitat. We know what sometimes takes place after a post-mortem examination, when it is exceedingly difficult to get rid of the smell of the corpse from the hands, cleanse them in whatever way you will. I am speaking now more particularly of what happened some years ago, before carbolic acid and other disinfectants were much known or used. It is not so difficult now as it was. At all events, I believe that the nails and the neighbourhood of the nails are the parts more particularly liable to harbour these infecting materials. It seems to me rather unlikely that the clothes carry infection so readily. Of course, where a person allows the cuffs of his coat to be dipped in putrescent material, and then makes an examination of a patient in childbirth, something may happen after that. On the whole I think the hand is particularly efficacious in this matter. I share the opinion that very great attention should be bestowed on cleansing the hands in all cases where they are to be used in midwifery practice. A good deal has been said of late years in reference to the armamentaria that medical men should be provided with; and I think a useful addition would be a pot of carbolic ointment and a nail-brush. In the next place I would remark that it has seemed to me that any animal poison introduced from without may produce what we term puerperal pyæmia, the same as may be produced by a student who is handling surgical wounds in the hospital and attending midwifery cases. (Dr. Graily Hewitt, p. 334.)

Puerperal fever is nothing more nor less than septicæmia. We have more than one substance—one in particular—that will not tolerate the presence of putrid animal matter or septic poison; this drug is iodine, which as soon as it is brought into contact with septic matter, is converted into two harmless substances. Let any medical practitioner who has

been in attendance on any case, whether a parturient female or any other, where there happens to be putrid emanation, wash his hands in water into which he has poured tincture of iodine, and I will answer for it he has no septic matter under his finger-nails. Again, if he fancies that his clothes, hair, and skin are saturated with it, let him go into the watercloset (I mention that as the smallest room in the house), place a few scales of iodine on a plate and put a spirit-lamp under it, and he will soon find himself surrounded by a violet vapour which will fall upon him in a shower of minute scales, from which he has only to protect his eyes. If he then carries with him any of the puerperal poison, my whole theory of the disease must be wrong. One thing I can assert, that in my own practice I have never had a case of fatal puerperal septicæmia since I have used iodine as an antiseptic, now more than twenty years ago. Iodine is equally efficacious in warding off septicæmia in other surgical diseases. I have injected solutions of septic poison under the skin of guinea-pigs, and produced death by septicæmia; I have also injected some of the same solutions, into which I had dropped a few drops of tincture of iodine, without producing any ill effects. It is needless to observe that the prevention and the cure of this disease go hand-in-hand together. Should any septic poison be present in the puerperal woman, wash her out again and again with solution of iodine until the solution comes back the same colour as it was thrown up. (Dr. W. Williams, p. 342.)

It is the duty of every practitioner to avoid, as far as possible, any communication of the effluvia, secretions, or emanations of fever, erysipelas, pyæmia, unhealthy sores, or the like, to his obstetric patients. This implies that he shall use all the precautions which modern science or his own knowledge recommend, such as the use of antiseptics, change of clothing, selection of time for visiting, and the like; but cannot possibly imply, in the present state of society, that no general practitioner shall, with proper care, visit simultaneously any cases of infectious disease and cases of confinement. One of the most important precautions, however, is to abandon for a time the practice of midwifery whenever the practitioner is compelled (using Dr. Duncan's own word) to nurse a case of scarlatina, &c. By nursing, I mean to very frequently visit, stay with, or handle as a nurse does: the only means of saving many cases of fever. When a group of symptoms, probably due to septicæmia or approximating to that popularly termed puerperal fever, has occurred to a practitioner, he should redouble the usual precautions; and,

if he meet shortly with a second case in his own practice, he is morally bound—I suspect legally also—to abstain from midwifery practice for some weeks. If Dr. Duncan could by statistics, of which he is so great a master, and which seem invariably to obey his command, determine the exact time of necessary quarantine, he would confer the greatest possible obligation, in more senses than one, upon the medical profession. A professed obstetrician should not indulge in *post-mortem* examinations, or other probable sources of septicæmia. (Dr. J. Thorburn, p. 340.)

Puerperal Fever and Erysipelas.—Mr. Squire, of Wivenhoe, had a case of scalp wound, which he dressed just as an attack of erysipelas was, unknown to him, commencing in it. Directly traceable to this he had nine cases of erysipelas and two of puerperal fever, with six deaths. (Mr. S. N. Squire, p. 346.)

SICKNESS OF PREGNANCY.—Pass the finger into the os and slightly dilate it till the puckered edge is smooth. This will not bring on premature labour. Judging by three cases in which this plan proved successful, after all other means of treatment had failed, the os will be found patent, puckered, and dilatable. This means of cure was accidentally found out in a case which was so serious as to appear to necessitate the induction of premature labour. The os was slightly dilated by the finger in the manner described, but nothing further was done at the time. The sickness ceased at once, and the patient went to the full term of pregnancy. (Dr. E. Copeman, p. 303.)

In a case of such obstinate vomiting in pregnancy that it was decided to induce premature labour, the os was dilated with the finger, and then to some extent with Barnes' smallest bag. From the time that this was done all vomiting ceased, and some nourishment was taken. The bag was removed, and further interference deferred. The next day, however, she was suddenly delivered, a slight pain being the only previous warning. So far as it goes this case corroborates the observation of Dr. Copeman, of Norwich. (Dr. J. Thomas, p. 306.)

ULCERATION OF CERVIX UTERI.—*Nitric Acid.*—Nitric acid, as a caustic in uterine practice, is preferable to nitrate of silver and to potassa fusa. Nitric acid is a really efficient caustic, producing a slough, which is peculiarly firmly adherent, and which consequently necessitates a healthy effort by the subjacent parts for its separation. The only other caustic which produces a slough of the same character is nitrate of mercury.

Nitric acid moreover requires no special preparation ; it does not spread like potassa c. calce, nor is its action so deep ; it produces little or no pain and no hemorrhage. These advantages are trivial compared with the fact, that when once it has been properly applied, in many cases no further interference is necessary, and thus the frequent use of the speculum may be done away with. The acid is best applied by means of a small and tightly rolled piece of cotton-wool, which is to be placed by an ordinary speculum forceps in contact with successive portions of the surface until the whole is covered with a white eschar. In a case of chronic endocervicitis, the acid should be applied to the interior of the open cervical canal, and if it is not open the case is not one suitable for the treatment. The contraction which accompanies healing is only to a healthy and natural degree. Provided the caustic has been used with ordinary prudence, I have never seen anything but good follow its use, and the ease with which a chronic case of cervical catarrh, with ulceration or erosion, may be cured by it is something marvellous. (Dr. James Braithwaite, p. 301.)

MISCELLANEA.

CHANGED ALOIN.—*A New Aperient.*—Aloin is a crystallizable substance procurable from aloes, and supposed to be its active principle. It possesses all the purgative properties of aloes. A solution of aloin set aside for some months deposits an uncrystallizable substance denominated “changed aloin.” It is soluble or easily reducible to a fine powder. It possesses the same purgative properties as aloin, and may be given either by subcutaneous injection or in pills containing one or two grains. These pills I administered to various individuals and in very different circumstances, and in all cases found them a mild but certain aperient. I administered these pills to several persons of sedentary habits, and succeeded in removing the constipation so common in such circumstances. I found that one or two grains daily of changed aloin were sufficient to accomplish that object. I also gave these pills to pregnant females shortly before confinement, and in several cases administered them to females a few days after they had been delivered, and in both cases found them to answer exceedingly well. In no case was there any griping, nor did any bad result follow. (Dr. Craig, Edin. Med. Journal, May, p. 1002.)

CHLOROFORM POISONING.—*Combined Inversion and Artificial Respiration.*—In cases of apparent death from chloroform, if possible, first invert the body, as recommended by Nelaton,

and then produce artificial respiration, the inversion being continued. A remarkable case illustrative of this is related, in which respiration and the action of the heart had ceased. Six minutes elapsed before the first feeble natural respiration occurred. (Mr. S. M. Bradley, p. 365.)

Nitrite of Amyl.—The effect of inhalation of nitrite of amyl upon the optic disc is to produce enormous dilatation and engorgement of the blood-vessels (arteries and veins, but especially the veins,) leaving no doubt as to simultaneously existing cerebral hyperæmia, with greatly accelerated circulation of blood. This action of nitrite of amyl suggested its probable use in cases of faintness or defective breathing or heart action whilst a patient is under the influence of another anæsthetic. The result of experience in its use confirms this idea. It is found to produce a quick restoration of breathing, of a good colour, and the rapid appearance of sickness. (Mr. C. Bader, p. 364.)

ETHER AS AN ANÆSTHETIC.—With regard to the efficiency of ether, I may say that I finally abandoned the use of chloroform three years ago. Since that time I have performed at least fifteen hundred operations upon the eye at St. George's Hospital, and a smaller number at the Royal South London Ophthalmic Hospital, using ether as my sole anæsthetic. Its administration requires from two to four minutes, and the anæsthesia which it produces leaves nothing to be desired. It has been in use at St. George's Hospital for a still longer period in general surgery; but until Dr. Joy Jeffries, of Boston (U.S.), taught me in 1872, the proper method of administering it, I did not consider it available for ophthalmic operations. Unless given with great freedom, it does not completely relax the muscular system. (Mr. R. B. Carter, p. 367.)

For the efficient and safe administration of ether, the following points are needful to be known and remembered. 1st. That kind of ether should be used which is fittest for the purpose of inhalation, and this is the pure anhydrous washed ether, sp. gr. 720; free from alcohol and water. Robbins's "ether for local anæsthesia" is a dangerous compound for inhalation. It was this last which was used in a case recently fatal at Manchester. 2nd. The ether should be given in such a way that the inhalation may be commenced with a very weak vapour, which, after a few inspirations, can be rapidly increased in strength. If we begin with too powerful a vapour, the air-passages are intolerant of it, and the patient resists the inhalation; but after a few moment's inhalation

of a weak vapour, its strength can be increased without inconvenience, and the patient rapidly brought under its influence. I think a cone of felt, covered with thin mackintosh, is the simplest and best apparatus for this purpose. 3rd. Stimulants should not be administered before the inhalation. Ether is itself a stimulant, and can be safely given in cases where there is great depression; but, as Mr. Clover has pointed out, it is very undesirable to have alcohol in the stomach when ether is being inhaled. 4th. Whatever danger may belong to ether has relation to the respiratory function. The breathing should therefore be watched; and, I may add, it is desirable so to place the head of the patient that the saliva (the secretion of which is increased by the ether) may run out at the corner of the mouth rather than into the trachea. (Mr. J. W. Haward, *Lancet*, Aug. 7, p. 228.)

IODIDE OF POTASSIUM.—*Therapeutic Uses of.*—I think that iodide of potassium has a far wider range of usefulness than in syphilitic cases only; that, like the bromide, it has a manifest influence upon the blood-supply of the brain, and that it cures maladies, such as recurrent nocturnal headache, which cannot be traced to a syphilitic origin, or described as syphilitic except by an abuse of language. Like the bromide, the iodide is frequently given in doses which are well-nigh useless; an error which perhaps arises from the circumstance that some patients are extremely susceptible to the action of the medicine. If we habitually order ten grains three times a day as a commencing dose, we shall find, in nearly all the cases in which the iodide is useful, that this dose may be rapidly increased to double or treble the quantity, or even beyond these limits. (Mr. R. B. Carter, p. 256.)

SALICYLIC ACID.—*To render it Soluble.*—Salicylic acid is insoluble in water in a larger proportion than 1 part in 300, and the alcoholic solution and the pure acid are both too irritating to be applied to a wound. It has however been recently discovered that 10 parts of the acid can be dissolved in 100 parts of water, provided 8 parts of borax are present. The borax must first be dissolved by the aid of heat, and then the acid added gradually to the boiling liquid. The most suitable strength in which this solution can be used for wounds is one which contains from $2\frac{1}{2}$ to 5 per cent. of salicylic acid and 2 to 4 per cent. of borax. (Dr. H. Bose, Berlin, p. 354.)

PRACTICAL MEDICINE.

DISEASES AFFECTING THE SYSTEM GENERALLY.

ART. 1.—THE ETIOLOGY OF TYPHOID FEVER.

By the EDITOR OF THE MEDICAL PRESS AND CIRCULAR.

Notwithstanding the many excellent monographs we possess upon the subject of typhoid fever, it must be said that much remains to be done before the medical world shall become unanimous upon all points in the history of that very important disease. A discussion has recently taken place in the Société de Médecine Pratique of Paris which throws some light on the etiology, a point always very obscure. Dr. Flamarion mentioned that he had observed seventy-eight cases of this affection at the end of 1873 and the commencement of 1874 in two villages in Haute-Marne, twenty-seven of them being in Louvières and fifty-one in Donnemarie. Only two of these patients died, one of them during the disease, and the other in the period of convalescence, in consequence of imprudence.

The author, without going into any generalities about the etiology of typhoid fever, limited himself to seek out what was the origin of the two epidemics he had witnessed. He insisted particularly upon the evil influence which the water seemed to maintain, considered either as causing exhalations, or as an article of consumption. It seems that at Louvières twenty-one patients out of twenty-seven lodged in houses the doors and windows of which looked out upon a watercourse, which was pretty clear, but along which, for some years past, each house had established a sort of washing establishment, which became the receptacle of the kitchen refuse, and sometimes of filth.

Dr. Flamarion, with Pettenkofer, makes the level of the underground water play an important part in the production of typhoid fever. The lowering of this level, after a long drought, must, he thinks, contribute to provoke a putrid fermentation in the bed of such underground streams. For some years past the inhabitants of Louvières, it seems, had given up

getting their supplies of water from springs which arose above the ravine, and had drawn them from a new spring in the middle of a little hill. Now, it was impossible not to be struck with the very regular succession, after the dryness, of the appearance of new cases of typhoid fever in July and September, 1873, in this village.

At Donnemarie there was no watercourse, except a little river, which ran at the foot of a hill, at the top of which the village was situated. When rain falls, the streets are furrowed in all directions by currents of water which may sometimes change into little torrents. These unite in a double stream, which merges into one in the middle of the hill, where the public fountain is situated. These streams, thus contaminated, become infiltrated by the waters which wash the dunghills and carry with them the straw, so that, when it rains, there issues from the pipe of the public fountain a dirty, muddy water, which the cattle sometimes refuse to drink. A remarkable fact is that the epidemic in this village commenced at the beginning of December, after abundant rains, and that the recrudescence of the disease has always coincided with an elevation of the layer of water in the pluviometer. The chemical analysis of the fountain water, in December, showed a great quantity of organic matter in it.

With regard to the treatment of typhoid fever, the author mentions some of the so-called special treatments of the disease; and he more particularly insists on the treatment of Brand, which he could not try in the country on account of the prejudice of the country people. He does not see that this method, which at first promised so much success, now gives results more favourable than those obtained by Valleix, Bouillaud, Andral, and Louis. The best statistics vary from 6·6 to 9·7 per cent.

Dr. Flamarion, for his part, said that he had employed a treatment apparently very complicated, but which was based on the general principle of watching indications, which he divided into general indications, directed to the whole of the symptoms and to the form of the disease, and special, which were directed to each separate symptom. Thanks to this treatment, the author had lost only 1·33 per cent. of his patients, for he eliminated the case of death due to imprudence at a time during convalescence, when cure might be considered as certain.

Dr. Flamarion then passes in review the different methods of treatment which have been suggested to him by the general indications, in the forms of ambulatory, mucous, and ataxo-dynamic fever. He then refers to the methods of treatment suggested by the special symptoms of each case, such as head-

ache, delirium, pain in the spine, fever and heat, fuliginosities, diarrhoea, vomiting, constipation, meteorism, piles, bronchitis, hypostatic congestion, pneumonia, and gangrene.

It will be seen by this *résumé* of Dr. Flamarion's paper, that in France, as in this country, it is now beginning to be almost universally admitted that the prominent cause of typhoid fever is the impurity of drinking-water. Instances have of late years been so multiplied of the evil effects of the communication of sewage with drinking-water that there are probably but few physicians who now refuse to admit that this is the chief cause of the occurrence of epidemics of typhoid fever. Dr. Flamarion says but little about the contagious nature of the disease.

With respect to the treatment of Brand by cold water affusions, one very great difficulty in carrying this out has been mentioned; and that consists in the great prejudices against such a treatment, which exist even in London and in the best conducted hospitals in this country. It is doubtful, on this account, whether the cold-bath treatment of typhoid fever has ever been fairly tried in this country as yet. Whether Dr. Flamarion's wonderfully excellent statistics could be verified in London is a matter of grave doubt, and we suspect that, under all treatments, the mortality from typhoid fever will occasionally prove very high in such large cities. But there seems to be some prospect of almost entirely getting rid of typhoid fever from our better-drained towns. Meanwhile, the last word has by no means been spoken about typhoid fever and its etiology and treatment.—*Medical Press and Circular*, April 14, 1875, p. 322.

2.—CONTAGIA AND BACTERIA.

Reported by Dr. CHARLES A. CAMERON, Prof. of Chemistry and Hygiene in the R. C. Surgeons, Ireland.

On the 6th April, 1875, Dr. H. Charlton Bastian, Professor of Pathological Anatomy, University College, London, delivered before the Pathological Society of London an address on the Germ Theory of Disease. Dr. Bastian is a well-known and an able advocate of the doctrine of spontaneous generation. Though he has not been able as yet to adduce any proofs of the evolution of living organisms from mineral matter, he believes that he has conclusively demonstrated the fact that certain low forms of life are generated during the decay of organic matter, and that they are not necessarily produced from living beings of a similar kind. With reference to bacteria—which so many pathologists now consider as closely related to the disease poisons, if some of them be not actually

the virus of zymotics—Dr. Bastian argues that they are merely “pathological products.” He admits that they are found abundantly in pus, in the tissues of persons suffering from certain contagious diseases, but he contends that they are also widely distributed throughout the human body in connexion with dying tissue, and that their existence therein is most easily explicable by the assumption of an origin by heterogenesis and by archebiosis. When, however, bacteria do come into existence spontaneously as a product of the decomposition of nitrogenous tissues, then, according to Bastian, they multiply rapidly according to “the ordinary fashion.” The greater part of Dr. Bastian’s address is devoted to an attempt to refute the views of Pasteur, Burdon-Sanderson, Beale, Lister, and other upholders of the germ theory of disease; and he sums up his arguments by enumerating the following “facts,” as he terms them:—

“1. With two exceptions, no definite germs or organisms are to be met with in the blood of patients suffering from these diseases during any stage of their progress.

“2. The virus or contagium of some of these diseases, whatever it may be, does not exhibit the properties of living matter.

“3. On the other hand, the virus of most of these contagious diseases with which definite experiment has been made is most potent in the fresh state, whilst its power very distinctly diminishes in intensity as organisms reveal their presence more abundantly therein—facts which would seem to point to the conclusion, or at least are quite consistent with the notion, that the contagious poison may be a chemical compound which gradually becomes destroyed or modified by the successive changes taking place in association with processes of putrefaction.

“4. There is the extreme improbability of the supposition that this whole class of diseases should be caused by organisms known only by their effects.

“5. The facts of the sudden cessation, periodical visitation, and many of the other phenomena of epidemics, however difficult they may be to explain upon any hypothesis, seem to oppose almost insuperable obstacles to the belief that living organisms are the causes of such epidemics of specific contagious diseases.”

Dr. Bastian labours hard to demolish the germ theory of disease; but why does he not furnish a more plausible, or even as probable a hypothesis to account for the propagation of contagious maladies. He should recollect the oft-quoted words of Horace:—

“Si quid novisti rectius istis
Candidus imperti; si non his utere mecum.”

Is there any “fact” better established than that a healthy

person may contract small-pox or typhus from an infected person without actual contact of bodies? Does not the history of Asiatic cholera prove to a demonstration that the disease is only propagated along the highways of man? Would the recent outbreak of measles amongst the Fijians have occurred if their island-homes had remained unvisited by Europeans? It is impossible to answer any of these questions except by the most emphatic affirmatives. That a *something* passes from sick to healthy men and other animals and produces a specific disease is now an incontrovertible fact. Surely if such be admitted, the existence of a contagium of some kind must also be acknowledged. The contagium can hardly be a gas, or be produced by "abnormal conditions of the atmosphere;" for, if that were the case, how could we explain the propagation of vaccinia or of syphilis? We have read most carefully through Dr. Bastian's address; but it has failed to shake our belief in the germ-theory of disease. We admit with him that bacteria swarm in decaying animal and vegetable matter, when no disease is present. We also grant that, whilst bacteria occur in great numbers in the blood of certain of the lower animals in a normal state, they are absent from the blood of men when in health. This proves nothing. Every microscopist knows that bacteria are to be found almost everywhere. Beef-tea, a few hours old, swarms with them. Almost everything we eat contains them. Bacteria of the ordinary kind are, no doubt, harmless enough; but there may be forms of life resembling, only in their structures, the bacteridæ, but which may differ as widely from others in their effects upon man as the poisonous fungus does from the edible mushroom with which it is often confounded. There are diseases which every one admits are produced by living organisms, animal and vegetable. Most of the diseases of our agricultural plants are produced by minute vegetables, which multiply with great rapidity. The itch in man, and the scab in the lower animals, are undoubtedly contagious diseases, as they are produced by the introduction of living beings and their multiplication within the body. If the itch acarus were so minute that the microscope could not discover its existence, we should have Dr. Bastian denying that it was caused by a "living organism capable of reproducing its kind." Dr. Bastian gives no satisfactory explanation of the remarkable facts proved by Chaveau, and subsequently by Burdon-Sanderson—namely, the existence in the infecting matter of vaccine and of sheep-pox of organised and moving particles, upon which the infecting properties of the matter depend. He says that the fact that dried vaccine retains its vitality is against the assumption of the existence of disease germ in it. But why should it be so?

Desiccated seeds retain their vitality. The grains of wheat found in the pyramids, in the hands and tombs of Egyptian dead, though 3,000 years old, have developed healthy plants—the “mummy wheat.”

In the discussion which followed the reading of Dr. Bastian's papers, Dr. Dougall, of Glasgow, supported the author's views, as did also, to some extent, Dr. Crisp. On the other hand, Dr. Bastian's views were combated very ably by Dr. Maclagan. The latter stated that it was not necessary to disbelieve the possibility of the spontaneous development of bacteria in order to hold consistently the germ-theory of disease. He agreed with Dr. Burdon-Sanderson that all microzymes are not contagia, but that all contagia may be microzymes. He admitted that Dr. Bastian has experimentally proved that bacteria were pathological products; but he contended that the establishment of that fact in nowise invalidated the germ-theory of disease.

Dr. Dougall, who agreed with Dr. Bastian, pointed out that the results of his experiments proved that putrefaction took place in liquids without the simultaneous appearance of bacteria, whilst bacteria were to be found in liquids which were not fermenting. The two phenomena are distinct and not necessarily even correlated. We do not, however, think that the illustration of a case in which putrefaction is present without the occurrence of bacteria, adduced by Dr. Dougall, is very striking. He stated that a mixture of blood and one-eighth of its weight of solution of potash, evolves at once a putrid odour, which it retains for a fortnight. At the expiration of two or three months no albumen is to be found in the liquid, in which bacteria are never found. We would venture to suggest that such a mixture would not putrefy in the ordinary sense of the word, but would be chemically acted upon by the powerful corrosive agent, potash, and decomposed. We are, however, aware that Dr. Dougall has observed putrefaction in liquids which were not undergoing decomposition from external chemical agencies, and which did not contain bacteria. But all this has really no direct bearing upon the germ-theory.

Mr. Jonathan Hutchinson agreed with Dr. Maclagan in attributing the causes of specific fevers to the introduction of specific germs into the system, but he did not agree with him in thinking that the contagiousness of certain forms of inflammation could be accounted for by the germ theory. In the case of syphilis and of erysipelas, he considered that the products of inflammation might themselves be the means of “contagion by contiguity and the patient's own tissues; contagion through the patient's vascular channels, it may be to somewhat distant parts; or a contagion, if the conditions

favour such a transplantation of them, to another individual." On reviewing the whole paper, and the discussion which followed it, we cannot avoid coming to the conclusion that the supporters of the germ-theory had the best of the argument. So far as facts go, no very new ones were adduced, and, indeed, are scarcer than theories in relation to our knowledge of the causes of zymotic maladies and contagious inflammations. But it seems, from every point of view, more rational to assume that contagious affections of all kinds are produced, each of them by a specific germ, than to take for granted that they arise from the introduction of ordinary particles of dead matter into the system. Dr. Maclagan was happy in his suggestion that the increase of bacteria in a fluid in proportion to the diminution of the intensity of its septic virus, which was adduced by Dr. Bastian as an argument against the germ-theory, is probably due to the bacteria increasing at the expense of the contagium itself, which he held to be a living entity, "minute beyond the reach of all sense."—*Dublin Journal of Medical Science, August, 1875, p. 145.*

3.—ON THE PREVENTION AND TREATMENT OF SCARLATINA AND OTHER INFECTIOUS DISEASES BY THE INTERNAL ADMINISTRATION OF DISINFECTANTS.

By Dr. DAVID J. BRAKENRIDGE, Assistant-Physician
to the Royal Infirmary, late Physician to the Royal
Hospital for Sick Children, Edinburgh.

The whole phenomena in infectious diseases are best embraced and explained by the germ theory. Whether the minute particles of living matter which constitute disease-germs consist of animal or of vegetable bioplasm, is a question which remains to be solved. Probably the latter view is the correct one. There certainly does appear to exist a close analogy between the behaviour of such disease-poisons on the one hand, and ferments on the other.

On this hypothesis we can readily understand how certain chemical agents, which have been found to destroy the life or inhibit the activity and multiplication of those organisms which are invariably associated with fermentation and putrefaction, and coincidently, if not consequently, to arrest these processes themselves, should have been successfully employed to prevent the spread of infectious diseases.

It has, thus, long been the practice to subject to the influence of such agents as permanganate of potash, chloride of lime, sulphurous acid, carbolic acid, &c., all liquid and solid sub-

stances supposed to be impregnated with the poison of an infectious disease. And striking results have been obtained by mixing the air itself—the medium through which the minute germs might be wafted into the body—with disinfectant gases.

A very universal accord has long been, and still is, given to the belief that by such means infectious diseases can be more or less disarmed of their virulence, limited in their spread, or even altogether prevented.

When fever breaks out in a house, a sense of comparative security accompanies the free and judicious use of disinfectants. Even the prudent physician is careful, in such a case, before leaving the sick-room, to wash his hands with Condy's fluid or carbolised soap.

Supposing, however, that our means of disinfection, external to the body, were perfect, it would still be impossible to keep an individual, in all his surroundings, perpetually thus protected. We are constantly called upon, not merely to prevent the spread of disease, but to cure actual attacks which threaten life. Attention has, therefore, been much directed of late to the following question. When a case of infectious disease has actually occurred, can any disinfecting influence be brought to bear upon the disease-germs within the body? Is it possible, in short, to disinfect the living tissues? Admitting the analogy between disease-action and putrefaction or fermentation, it must be allowed that, if we can so disinfect the tissues of a living animal, that when it is put to death they will resist putrefaction, there is no reason why we should not hope to be able by suitable means to arrest or prevent zymotic disease.

Professor Polli, of Milan, administered to animals, without any ill effects, large doses of the sulphites of the alkalies and alkaline earths. These animals were killed, and it was then found that, whilst an animal killed under ordinary circumstances rapidly putrefied, those animals to which the sulphites had been administered showed no signs of putrefaction.

Dr. Sansom fed two guinea-pigs "with pills composed of arrowroot mixed with sodium sulpho-carbolate. No other food was given. In four days the little animals had consumed 275 grains of the salt. No obvious effect was produced, except a slight looseness of the evacuations." The animals were then killed, and it was found that "the flesh showed a marked tendency to resist putrefaction."

In the Royal Hospital for Sick Children, and more recently in the scarlet fever wards of the Royal Infirmary, I have for some years had considerable opportunities of studying scarlet fever. It has been my practice to leave the disease to follow its natural course, and to content myself with the treatment

of symptoms or complications when these called for interference. Last autumn, however, a succession of very severe and rapidly fatal cases occurred within a short period. I then determined to test fairly the value of the internal administration of disinfectants; for this appeared to me to be the only method of treatment which had any theoretical value to recommend it. Of the various substances employed for this purpose, the sulpho-carbolate of sodium, originally proposed by Mr. Crookes, and afterwards more widely introduced by Dr. A. E. Sansom, seemed to be the most suitable. The advantages of this salt may be gathered from the following account of its action, which is given by Dr. Sansom in his valuable work on "The Antiseptic System":—

"It was found that twenty-grain doses of sodium sulpho-carbolate could be readily administered to adults. So free from taste was the solution, that many said it seemed only like water itself. The dose was increased in several cases to sixty grains, administered every four hours. The only direct effect noted was a slight tendency to vertigo or dizziness. The odour of carbolic acid could be readily detected in the breath. The urine of a patient who had taken 360 grains of sodium sulpho-carbolate in twenty-four hours, was collected and examined. It presented no evidence of the presence of carbolic acid, but contained a considerable quantity of sodium sulphate. It showed a marked tendency to resist putrefaction.

"It would appear, therefore, that sodium sulpho-carbolate administered to a living animal is rapidly absorbed and projected throughout the system. In the blood or the tissues the double salt is decomposed, the sodium sulphate being set free in the tissues, and ultimately excreted by the kidneys; the carbolic acid, also liberated in the textures eventually, for the most part escaping by the lungs. It is probable, also, that some portion of the carbolic acid is eliminated by the urine. It follows that the administration of sodium sulpho-carbolate is an indirect means of administering carbolic acid; and inasmuch as at least one-fourth of the weight of the sulpho-carbolate employed consists of carbolic acid, we find that an amount equalling from fifteen to ninety grains per diem can be administered of the latter. It is obvious that the direct administration of this amount of carbolic acid would, from its nauseous character and its difficulty of manipulation, be not readily accomplished; and there would be a danger of the toxic action of the latter being manifest—a result which does not occur when the sulpho-carbolates are administered. One would imagine that, in this latter case, there is a gradual evolution of carbolic acid, which at no time is in sufficient amount to manifest its poisonous action."

Commencing with moderate doses of the sodium sulpho-carbolate, I soon found that, as stated by Dr. Sansom, from twenty to thirty grains, every two hours, could be easily taken by adults for a considerable length of time, without any inconvenience or physiological disturbance of any kind.

I have never in any case encountered vertigo, dizziness, or any symptom that could fairly be attributed to the salt. For the last seven months, every case that has been brought into the Infirmary, or has occurred in my private practice, has been at once put on this treatment. I have now treated upwards of sixty cases in this way, without having had one death.

The following is an analysis of fifty cases so treated in the Royal Infirmary. Of these not one failed to make a perfect recovery. Nineteen were males, and thirty-one females. Their average age was 17·5 years. The average duration of the disease before treatment was commenced was 4·4 days. Dating from the outset of the disease, convalescence with normal temperature had commenced—

In 18 cases in 6 days.			
„ 18	„ „	8	„
„ 5	„ „	10	„
„ 4	„ „	14	„
„ 2	„ „	17	„

In only three cases was recovery long delayed by sequelæ, and in these the sodium sulpho-carbolate treatment was commenced on the sixth, tenth, and fourteenth days of the fever respectively,—too late to prevent the after-effects of the disease. In forty cases no complication interfered with the quick and quiet subsidence of the fever. Albuminuria was observed in five cases: in three of these it merely amounted to a passing trace; in the remaining two it was persistent, and accompanied with blood and renal casts. These two cases are included in the three above-mentioned, in which the treatment was commenced late. Rheumatic pains, which were easily controlled, occurred in three cases. In three there was inflammatory swelling of the cervical glands, which in one strumous child resulted in abscess. In only two cases was any delirium noted: in one it was severe; in the other very mild. In forty-six cases the temperature and pulse fell steadily after the treatment was put in force. In only four was any rise over the first recorded evening temperature noted; in all of these it was insignificant in amount, and of short duration. Only one case came under treatment on the first day of the disease; the eruption was coming out, and was well marked. There was another case of scarlet fever in the same house. Treatment was at once commenced, and next day the eruption

had disappeared, and the pulse and temperature were normal and remained so. In another case, on the ninth day of the disease the medicine was suspended, the supply having run short. On the same evening, the temperature, which both on that morning and on the previous evening had been 100° , rose to 103° .

The patients who are taken into the Royal Infirmary are for the most part adults. But that the disease does not always run a mild course in such cases may be inferred from the fact, that of twenty-four patients admitted into the scarlet fever wards of the Infirmary during August, September, October, and November, 1874—the four months immediately preceding the commencement of the treatment by the sodium sulpho-carbolate,—no fewer than six died.

Up to this point, the results I have obtained by this method of treating scarlatina entirely support the favourable opinion which Dr. Sansom formed of it from his own experience. I have, however, ventured to go still farther than, in so far as I am aware, anyone who has used internal disinfectants has gone. So marked an influence did this remedy seem to exert on the actual disease, and so well was it tolerated in full doses, and for a considerable period, by all my patients, old and young, without exception, that *I determined some time ago, whenever I met with the disease in my private practice, to give the sodium sulpho-carbolate to all individuals exposed to the infection who were not protected by a previous attack.* For I argued, if by internal disinfectants we can destroy or inhibit fever-germs after they have multiplied indefinitely, and produced their pathological effects within the body, may we not reasonably hope that, by previously disinfecting the tissues of the body, the germs which first find their way into them will be much more easily destroyed or paralysed? I therefore hoped thus to be able either to modify or prevent attacks of infectious disease.

To be able so to control the activity of the disease-germs on their entrance into the body, that the resulting attack should with certainty be rendered mild and safe, instead of severe and dangerous, and the patient thus be protected against a future attack, appeared to me the more desirable end to be aimed at. For to prevent the attack altogether, however desirable this might be at the time, would be to leave the individual still liable to the disease. The results which I have up till now actually obtained have exceeded my utmost anticipations, and require, I am fully aware, to be recorded and received with due caution.

I have administered the sulpho-carbolate of sodium for the above purpose in doses varying, according to age, from five to thirty grains three or four times a day, and sometimes, when well borne more frequently, to those exposed to the poisons of scarlet fever, diphtheria, and measles. It was given in seven families to twenty-two individuals exposed to the poison of scarlet fever; in three families, to fifteen individuals exposed to the poison of diphtheria; and in three families, to eight persons exposed to the poison of measles. The diseases have not in a single instance extended beyond the individuals first affected. In the cases of scarlet fever, the patients as well as those exposed to infection, were treated with full doses of the sulpho-carbolate; and in this way the infection may have been lessened. The cases of diphtheria and measles were treated on ordinary principles, and the absence of any spread of the diseases in these instances must be attributed either to accident or to the protection afforded by the sulpho-carbolate. I think it right, however, to mention that, although the mortality from scarlet fever has been considerable during the last eight months, I have been informed by several of my professional brethren that cases have not been uncommon in which the disease has remained confined to the member of the family who first took it, and that in some instances the other children, although freely exposed to the poison, have all escaped. I am therefore far from feeling that I have proved, even to my own satisfaction, that by the internal use of a disinfectant we can entirely prevent or modify attacks of infectious disease. The results I have obtained in the above cases are, however, I think, sufficiently remarkable to be recorded, and I now publish them in the hope that during the severe epidemic of scarlet fever which we are likely to encounter during the coming autumn and winter, the plan which I propose, and have to a limited extent tested, may be fully and fairly tried. The question has this further interest attaching to it—that upon its success or failure hinges the whole question of the value of internal disinfection. For if this method is not decidedly effectual at the very outset of the disease, when the poison is small in amount and quiescent, can we expect much benefit from it after the disease-germs have multiplied enormously, and their mischievous effects upon the system have commenced? I have as yet employed only the sodium sulpho-carbolate for the purpose of internal disinfection. Other substances may yet prove equally or more useful, and the plan should be applicable to all the so-called zymotic diseases.—*Medical Times and Gazette*, July 24, 1875, p. 92.

4.—ON THE PREVENTION AND TREATMENT OF SCARLATINA AND OTHER INFECTIOUS DISEASES BY THE INTERNAL USE OF DISINFECTANTS.

By Dr. WILLIAM SCOTT, Consulting Physician to the Aughnacloy
Hospital for Fever and Infectious Diseases.

The possibility of disinfecting living tissues—of neutralising the influence of, if not destroying, disease germs within the body is, perhaps, practically the most important question which either the physician or general public can be called on to consider. That the whole phenomena in infectious diseases are best embraced and explained by the germ theory will, I have no doubt, become clearer and more satisfactory just in proportion to the increased amount of thoughtful attention given to the subject by the intelligent student. Even a non-medical writer, the justly celebrated Dr. Tyndall, arrived at this conclusion, and in his lecture on “Dust and Disease” says: “From their respective viruses you may plant typhoid fever, scarlatina, or small-pox. What is the crop that arises from this husbandry? As surely as a thistle arises from a thistle seed, as surely as the fig comes from the fig, the grape from the grape, the thorn from the thorn, so surely does the typhoid virus increase and multiply into typhoid fever, the scarlatina virus into scarlatina, the small-pox virus into small-pox. What is the conclusion that suggests itself here? It is this: that the thing which we call a virus is, to all intents and purposes, *a seed*; that in the whole range of chemical science you cannot point to an action which illustrates this perfect parallelism with the phenomena of life, this demonstrated power of self-multiplication and reproduction. There is, therefore, no hypothesis to account for the phenomena but that which refers them to parasitic life.” But even supposing the able reasoning of Mr. A. Wolff and others, advocates of a different view as to the correlation and causation of zymotic diseases, to be more correct and convincing than to me it appears to be, and omitting all reference as to whether the germ be of animal or vegetable nature, still the object and bearing of this paper would be little, if at all affected thereby. For assuming what at least is highly probable, that there exists a close analogy between the action of such germs or disease-poisons on the one hand, and fermentation on the other, it is easy to perceive how certain chemical agents capable of lessening the activity of or destroying the organisms invariably associated with putrefaction and fermentation should have been used to prevent the spread of infectious diseases, and few, if any, will be disposed to question the beneficial results of such a proceeding, confirmed as it has been by vast experience and overwhelming testimony. And

considering how long various substances recognised as disinfectants have been in general use, it is rather surprising that the question as to the possibility of bringing a disinfecting influence to bear upon the disease germs, or by whatever other name the primary influence might be known within the body, was not sooner made the subject of careful investigation. Nor does it seem unreasonable that if living tissues can be so acted on during life as after death to resist putrefaction, we should hope by suitable means to retard or wholly prevent zymotic disease.

Ever since the experiments of Polli with regard to the sulphites of the alkalies preventing putrefaction after death in the animals to whom during life they had been exhibited, and especially since the antiseptic value of carbolic acid had been so undoubtedly established by Professor Lister and others, it occurred to me that some combination of these agents must in all probability prove of inestimable value in the treatment, if not prevention, of those diseases perhaps most dreaded and fatal as regards the young. It was therefore with peculiar pleasure I saw the sulpho-carbolate of sodium had been proposed by Mr. Reeves, and widely introduced to the profession by Dr. A. E. Sansom in the following words:—

“It was found that twenty-grain doses of sodium sulpho-carbolate could be readily administered to adults. So free from taste was the solution that many said it seemed only like water itself. The dose was increased in several cases to sixty grains, administered every four hours. The only direct effect noted was a tendency to vertigo or dizziness. The odour of carbolic acid could be readily detected in the breath. The urine of a patient who had taken 360 grains of sodium sulpho-carbolate in twenty-four hours was collected and examined. It presented no evidence of the presence of carbolic acid, but contained a considerable quantity of sodium sulphate. It showed a marked tendency to resist putrefaction.

“It would appear, therefore, that sodium sulpho-carbolate administered to a living animal is rapidly absorbed and projected throughout the system. In the blood or the tissues the double salt is decomposed, the sodium sulphate being set free in the tissues, and ultimately excreted by the kidneys, the carbolic acid also liberated in the textures eventually for the most part escaping by the lungs. It is probable, also, that some portion of the carbolic acid is eliminated by the urine. It follows that the administration of sodium sulpho-carbolate is an indirect means of administering carbolic acid; and inasmuch as at least one-fourth of the weight of the sulpho-carbolate employed consists of carbolic acid, we find that an amount equalling from fifteen to ninety grains *per diem* can be adminis-

tered of the latter. It is obvious that the direct administration of this amount of carbolic acid would, from its nauseous character and its difficulty of manipulation, be not readily accomplished, and there would be a danger of the toxic action of the latter being manifest—a result which does not occur when the sulpho-carbolates are administered.”

I may here remark that in the numerous cases in which I have prescribed the use of the above-named salt not one presented the slightest symptoms of the vertigo or giddiness referred to as a direct effect of its use. It is not my object at present to enter on any detail of cases, almost exclusively scarlatina, treated by the sodium sulpho-carbolate. I prescribed doses varying from five to thirty grains, according to age, three, four, or five times daily, and invariably with the most satisfactory results. This, however, I feel, may perhaps be partly attributed to a certain number of favourable cases, and ought to be received with due caution. Of nearly equal importance is the probable prophylactic power of the sodium carbolate, and certainly the wonderful immunity which has followed its exhibition in somewhat similar doses to those heretofore mentioned among the attendants and others exposed to the diseased poisons has been fully confirmatory of the theory regarding its antiseptic action, and here I shall quote the words of Dr. Brackenridge, of the Edinburgh Royal Infirmary, an original thinker and actor touching its use: “I have administered the sulpho-carbolate of sodium for the above purpose (disinfecting the tissues) to those exposed to the poisons of scarlet fever, diphtheria, and measles. It was given in seven families, to twenty-two individuals exposed to the poison of scarlet fever; in three families, to fifteen individuals exposed to the poison of diphtheria; and in three families, to eight persons exposed to the poison of measles. The diseases have not in a single instance extended beyond the individuals first affected. In the cases of scarlet fever the patients, as well as those exposed to infection were treated with full doses of the sulpho-carbolate, and in this way the infection may have been lessened. The cases of diphtheria and measles were treated on ordinary principles, and the absence of any spread of the disease in these instances must be attributed either to accident or to the protection afforded by the sulpho-carbolates.” Again: “To be able so to control the activity of the disease germs on their entrance into the body, that the resulting attack should with certainty be rendered mild and safe, instead of severe and dangerous, and the patient thus be protected against a future attack, appeared to me the more desirable end to be aimed at. For to prevent the attack altogether, however desirable this might be at the time, would be to leave the individual

still liable to the disease. The results which I have up till now actually obtained have exceeded my utmost anticipations." Among the few, so far as I am informed, who have entertained any real interest in the question of internal disinfection, I am satisfied there is not one who does not feel the necessity for careful extended investigation. A full and fair trial must be made in a vast number of cases, not in a negligent fashion, but with the full conviction that a most important issue is at stake. It is quite possible that some other combination may eventually exceed in value, and supersede the sulpho-carbolate, besides which I have as yet only tried carbolic acid in conjunction with other ingredients in the form of a mixture, but partaking largely of the chemical qualities of the double salt. Three months of zealous intelligent watching and noting on the part of one hundred cultivated minds should be sufficient to amass an amount of experience capable of satisfactorily disposing of a question the solution of which might prove of equal value with the discovery of vaccination. A thousand such at least are within the ranks of the profession in Great Britain and Ireland, and labourers of the right sort cannot be too numerous.—*Med. Press and Circular*, Sept. 15, 1875, p. 204.

5.—THE TREATMENT OF SCARLATINAL ANASARCA.

By Dr. J. P. BRAMWELL, Visiting Physician to the County and City of Perth Infirmary.

[The following remarks are founded upon the treatment of thirty-two cases of scarlatinal dropsy during the last two epidemics of scarlatina which have occurred in Perth, the one in 1868 and the other in 1874.]

Scarlatinal dropsy generally appears between the tenth and twentieth day after deflorescence of the erythema. In some it is ushered in by pyrexial symptoms of more or less severity. As a rule, however, it creeps on in an insidious manner, the first thing that has excited alarm being the dropsical condition of the patient. The urine is lessened in quantity, ranging from three to twenty ounces in the twenty-four hours, and is of a smoky colour, with a disturbed muddy mucous cloud. It deposits sediments which, on microscopic examination, prove to be blood-corpuscles, hollow tube-casts, disintegrated epithelium, and urates, and, in some rare cases, the principal deposit is ammoniaco-magnesian phosphates. In six cases the urine was found to be acid, and contained the former deposits: in one case only was the ammoniaco-magnesia phosphate found. The fact that in some of these six cases uræmia symptoms were shown, does not seem to favour Frerich's theory of uræmia

poisoning by the transformation of urea into ammonia. If such were the case we would naturally expect an alkaline condition of urine more frequently associated with uræmia, which in point of fact is quite an exceptional occurrence in the malady.

It is almost superfluous to add, that the urine is always more or less albuminous. In some cases, however, both at their commencement and decline, boiling such acid urine will give no deposit or cloud, while the cold nitric acid test will give a well-marked deposit of albumen. This fact should be duly considered before pronouncing dropsical patients entirely free from danger.

The specific gravity is seldom below, generally above, the normal (1025-1030), thus entirely differing from the albuminous urine of chronic renal disease.

If this dropsical condition remains unchanged, a formidable train of symptoms sooner or later begin to show themselves, and that not always, as Sir Robert Christison has long ago pointed out, in proportion to the quantity of urea excreted. These symptoms are cough, dyspnoea, vomiting (sometimes of grumous blood), dry retching, headache, loss of sight and convulsions; all which symptoms owe their origin to one common cause—the poisoned condition of the blood by the retained urea. The bowels are generally much constipated, and the pulse slow and unrhythmical. If prompt means are not now employed, violent eclampsia generally ensues.

Scarlatinal dropsy is often a fatal malady. From the registrar's returns for Perth, I learn that of every 100 fatal cases of scarlatina, about twenty succumbed to this complication and its consequences. Of the thirty-two cases treated by me, one third never showed any local complications or symptoms of uræmia poisoning. The greater proportion, however, showed both, and some six or seven had convulsive paroxysms.

Treatment.—When the case was one of moderate severity, and uræmic symptoms not a conspicuous feature, sharp purgation with drastics, such as the comp. jalap or comp. scammony powders, answered very well. It was found, however, that a very large dose was required to produce the desired effect, 3 ss. or even ℥ii. of comp. jalap being often required for a child five or six years old. This purgation was alternated by vapour-baths, and at a later period, when a febrile action was diminished, inf. of digitalis with acet. of potash was administered with good results. It will be found, however, that dropsical symptoms in the majority of such cases will persist in spite of all these means, and go on from bad to worse till alarming pulmonary complications show themselves, or convulsions supervene. What now is to be our line of procedure? We venture to affirm, that at this juncture abstraction of blood,

either general or local—certainly general when there are convulsions—will act in a most beneficial manner, and convert in a short time an apparently hopeless case into a remediable one. In order to accomplish this, however, we must not hesitate to take blood freely, as ten ounces from the arm of a boy ten years of age, or four ounces by cupping over the loins in a child four or five years of age. Neither must we be deterred from this by the supposed anæmic condition which some writers on renal disorders have ascribed to such patients. The truth is, they are not anæmic at all, but are suffering from an acute disorder associated with a very different condition of blood from that existing in chronic renal disorders, and the rapidity with which they recover after sharp antiphlogistic treatment sufficiently shows this. Depletion acts like a charm in convulsions from acute uræmia, and we have seen a free diuresis set up in forty-eight hours after its employment, unaided by any other remedies.

The following is Dr. Graves's opinion of this practice: "By opening a vein in the arm and abstracting a quantity of blood proportionate to the age and strength of patient, you remove the inflammatory state of the constitution, and arrest at once the anasarca and the pectoral symptoms." Generally speaking, cases of anasarca after scarlatina stand antiphlogistic treatment well.

I am interested also to observe, that Trousseau, whose leanings in general are in an opposite direction from bloodletting, makes a special exception in favour of scarlatinal dropsy, thus showing his high powers of discrimination and accuracy as to facts.

It will be found that it is in vain to treat the various complications that occur in scarlatinal dropsy—such as pneumonia, cerebral congestion, hæmatemesis, &c.—as if they were idiopathic affections, seeing each and all of them depend upon a poisoned condition of blood from impaired kidney function. Let this latter condition only be removed by depletion, and the other disorders which depend upon it soon disappear without any special treatment whatever. There are pneumonias *and* pneumonias, there are cerebral derangements *and* cerebral derangements, and we must differentiate the treatment accordingly.

Medicine has fashions as well as other things, and bloodletting, at one time so frequently used and often abused, is now banished altogether. Such great swings of the pendulum, however, generally override the mark; it would be wiser to be a little more discriminating. One is forcibly reminded by all this, of a just observation by the late Sir Benjamin Brodie, to the effect that "the progress of medicine is not quite so great as it seems to be, because, while introducing new remedies, we are losing sight of and discarding others old and tried."

Let me further observe, that the adaptability of this remedy is not confined to some exceptionally sthenic epidemics, but has suited well in my hands in the same disorder occurring and recurring at considerable intervals of time. By a fair induction, bloodletting will be found an admirable remedy in all forms of acute uræmia, as uræmic puerperal eclampsia, acute desquamative nephritis, &c.

We have treated thirty-two cases of acute scarlatinal dropsy more or less after this fashion, with only two deaths. One of the fatal cases was seen too late, when no depletion could be thought of. This patient died of acute pulmonary oedema. From the severity of not a few of these cases, and the inadequacy of other means in a considerable proportion of them, there is no doubt in my mind but that several more of them would have terminated fatally had bloodletting not been boldly employed. Let me venture, then, to press this valuable old remedy in this disorder upon the notice of my professional brethren who may not have tried it, especially on the rising generation of physicians, who have been educated, perhaps, too exclusively in an expectant or building-up treatment of all inflammations indiscriminately.

The following cases will illustrate the treatment and the severity of the symptoms in some of the patients:—

Case 1.—A boy, aged eight years, about the fourteenth day of recovery from a mild attack of scarlatina, was seized with dropsical symptoms. He was purged by comp. jalap powder, and ordered calomel $\frac{1}{6}$ gr., tinct. digit. ℥iii., every six hours. His breathing soon became seriously impeded, and it was found that he was suffering from oedema of the glottis. This was subdued by free swabbing with a strong solution of nitrate of silver and insufflation of alum powder. Urine albuminous, but increasing in quantity. Symptoms of uræmia now supervened, namely, slow pulse, pain in the head, and dry retching. Next day came violent convulsions, at first at intervals, later all but constant. His pulse was pausing every third or fourth beat, his respirations were very hurried and laboured, and, at intervals, a gush of grumous matter like coffee-grounds, composed of altered blood, was ejected through his nostrils. About 8 oz. of blood were taken from his arm, and then chloroform was administered as often as a convulsion fit threatened. On turning him on his side, he became quiet and slept for several hours. A convulsion fit again threatening chloroform was re-administered, after which he slept continuously till next morning, when he awoke to consciousness. No more convulsions or uræmic symptoms recurred. He soon passed urine freely, the secretion being aided by bitartrate of potash and digitalis, and made a good recovery.

I may mention, that this patient belonged to an industrial school in the neighbourhood, and was in one of our Infirmary wards with six other boys from the same institution. By a strange coincidence, two of the other boys became dropsical and convulsed, one being amaurotic, and all but blind for four days, from retinal poisoning. All were bled at the arm, and all recovered.

Case 2.—A boy, aged eleven years, had a mild attack of scarlatina. Ten days after, the symptoms began to abate; he became slowly dropsical without any marked febrile reaction; his urine was albuminous, and contained tube-casts and renal epithelium in abundance, quantity 3 to 4 oz. in twenty-four hours. He was purged freely, had warm baths, counter-irritations applied to the loins, and diuretics, all to no purpose. His anasarca increased, and the quantity of his urine decreased slightly. Symptoms of uræmia beginning to appear, I bled him to 10 oz. Immediate relief followed, and in forty-eight hours he was passing 20-30 oz. of urine in the twenty-four hours. Although this urine continued albuminous, it steadily increased in quantity. He was kept strictly to bed, and had a warm bath every third night for two weeks, at the end of which time his urine was normal in quantity and quality.

Case 3.—A boy, aged six years, became highly anasarcaous after an attack of scarlatina; his urine was reduced to 2-3 oz. daily. Ordered liq. ammon. acet., vin. antimon., and warm baths after his bowels had been opened by comp. scammon. powder. No improvement followed. Infusion of digitalis and acetate of potash were now substituted, but neither skin nor kidneys could be got to act. Next day dropsy was still increasing, face very puffy, scrotum and penis much swollen, drowsy, and complained of his head; symptoms of pulmonary congestion also appeared. Four leeches were now applied to the loins, and a very copious flow of blood ensued: this was aided by hot poultices. The bleeding was difficult to control, and alarmed his parents, but no bad consequences followed. On the contrary, he began next day to pass urine in considerable quantity. A steady diuresis now set in, and the boy made a good recovery.

Case 4.—A little boy, five years of age, was admitted into one of our Infirmary wards with all the symptoms of scarlatinal dropsy. Three members of his family had scarlatina in a latent form, and all became dropsical. The little fellow referred to was quite water-logged, and of prodigious weight, considering his age and height. He was purged freely, and had calomel with digitalis, and mustard poultices applied to his loins, but all to no purpose. He was then cupped to 4 oz. of blood over the loins. In twenty-four hours a free diuresis

set in, and soon he began to pass urine in enormous quantities, and made a steady and complete recovery.

I could adduce numerous other cases of this kind, where the beneficial effects of depletion were sufficiently apparent. To do so, however, would extend my paper beyond due limits. I shall therefore conclude with the notes of another case which presented certain exceptionally interesting particulars.

Case 5.—A schoolmaster, into whose school scarlatina had entered, feeling out of sorts, called in medical aid. I found his face puffy, pulse somewhat irregular and slow, urine reduced in quantity, highly albuminous, and having a copious sediment of renal epithelium. He was ordered to keep his bed and use comp. jalap powders every third day, with vapour baths between. These remedies, however, did not relieve him, neither did digitalis and potash. In addition to his other symptoms, congestion of both lungs now set in; his sight became affected, mind somewhat confused. At three o'clock in the morning he had a convulsion. On arriving I found him coming out of it, but still confused. I bled him from the arm to 10 oz. Next day, I found him quite collected. The extracted blood was buffy and firm. Next day, secretion of urine was much increased, head symptoms gone, and chest symptoms much relieved.

Three days after the bleeding, he had a severe rigor, followed by delirium and phlegmonous inflammation of his arm, which ran on to the formation of pus, and required several free incisions for its relief. The constitutional disturbance was very high, and his life apparently in danger. His urine was exceedingly bloody for several days during this inflammatory attack. He was put on liq. ergotæ with beneficial results. In two and a half months from the date of his first ailing, he was able to resume his duties, the renal symptoms having completely disappeared.

Note.—I am not certain whether this case was one of dropsy following latent scarlatina or acute desquamative nephritis; but in either case it shows that bloodletting is the best remedy when acute uræmic symptoms supervene.—*Edinburgh Medical Journal*, July, 1875, p. 36.

6.—ON THE TREATMENT OF SCARLET FEVER BY THE EXTERNAL APPLICATION OF COLD WATER.

By Dr. JOHN EDWIN EDDISON, Physician to the Leeds General Infirmary, the Fever Hospital, &c.

[The two cases related by Dr. Eddison present no special feature except as illustrative of the treatment adopted—which is used

with needless hesitancy in scarlet fever. When the rash is well out, and fever high and temperature excessive, cold is always beneficial. We knew a child with the rash well developed run out of doors in his night-gown only, and throw himself down in the snow which was then very thick upon the ground, rolling about in it. He succeeded in well cooling himself before his mother returned to the room, but he recovered rapidly and well.]

Scarlet fever seems, more than any other acute disease, to lend itself to this treatment. The patients, as a rule, are young, and therefore easily moved about, and the beneficial results are generally more rapid than in the case of many other diseases.

All sorts of objections have been, and still are, urged against the use of cold in scarlet fever. Danger is said to arise from "driving in the rash," from internal congestion, from the rapid loss of body temperature and consequent depression, and it is also said that the risk of renal mischief is thereby increased. If it were proved that the occurrence of nephritis is more frequent after treatment by cold it would be a very valid objection to the practice of it, and the real truth can only be learned by an examination of a large number of cases. From my own experience I am inclined to disbelieve that any harm results in this way. The fear of the occurrence of nephritis from this cause originates no doubt in the generally accepted opinion that the affection of the kidneys so commonly occurring after scarlet fever is due to "draughts," or "catching cold," or to leaving bed too soon. I think this opinion is not founded upon sufficiently good grounds, and that every one in the habit of seeing cases of scarlet fever must often have seen nephritis beginning before as well as after the patient has left his bed, and as often in cases kept in warm stuffy rooms as in those in which fresh cool air has been freely admitted to the sick chamber. "Catching cold" is made to do duty as a cause of so many conditions for which we can find no better explanation, that it is adopted at once and without hesitation in order to account for any otherwise inexplicable phenomena. There appears, at any rate, to be no good ground for assuming that cold bathing increases the chance of an attack of nephritis, and in the two cases here reported the urine did not become albuminous after repeated bathing. Objections on the ground of the trouble and increased expense in nursing are scarcely worth consideration if it is true, as I believe it is, that this mode of treatment is better than any other. The difficulty is perhaps less in treating scarlet fever than in dealing with other cases because the patients are usually young and easily lifted in and out of the bath, but when from the weight of the

patient or the weakness of the attendants it is impossible to use the bath, the patient may easily be packed in wet sheets, with or without pieces of ice placed here and there, or india-rubber bags or large bottles filled with ice may be placed round the patient. The bath gives better results than any other plan when it can be thoroughly carried out, and the most satisfactory way is to begin with the bath at 98° or 100° , and cool down gradually to about 70° . It is of course better that the temperature of the patient and of the water should be frequently taken, but the hand is generally a good enough guide as to the water, and the appearance of the patient always indicates the improvement in his condition. This is well illustrated in the case of S. F. (aged eight), near the end of the fifth day. The little patient was then drowsy and delirious, the temperature being 104° , and three-quarters of an hour in a bath, beginning at 90° and cooled down to 68° , resulted in the cessation of delirium and drowsiness, and a reduction of the temperature (in axilla) to 95° . In the case of M. A. S. (aged four), a similar bath for one hour reduced the temperature from 105.3° to 95.6° . There was no dangerous depression or bad symptoms whatever from this low temperature. In scarlet fever, as in other allied disease, the cardiac impulse and the character of the heart sounds are safer guides as to the condition of the heart and circulation than is the pulse at the wrist, the latter being often very deceptive.

In the case of S. F., it will be noticed that the temperature rose again and again after removal from the bath, the rise beginning sometimes immediately, at others after an hour or less. This rapid rise is usual in severe cases, and the benefit derived seems always to be in proportion to the length of time during which the high temperature is warded off. It is worth consideration whether it will not ultimately turn out to be a better plan to keep the patient in the bath for many hours, even for a day or longer if necessary, cooling the water very gradually down, and maintaining it at whatever degree is found to keep the patient's temperature nearest to a healthy point. In the treatment of diseases or injuries of the skin, no evil, but, on the contrary, great good results from much more prolonged baths; and it seems far more reasonable to prolong the period of immersion than to take the patient out and allow the temperature to rise, to be again and again reduced in the same way. I am well aware that unpractised writers like myself often seem to be regardless of the time of their professional brethren, but I trust that the above remarks will not be considered too long nor be found altogether useless. The notes of the cases are, I think, sufficiently detailed and clear to need no further explanation. The first case was one of more than

usual severity; and the second, though not quite so serious, was yet by no means a mild case, as a temperature of over 105° and a pulse of extreme rapidity indicate.

I should add that all the baths were begun at a comfortably warm temperature—between 90° and 100° ,—and cooled down slowly to about 70° , or sometimes a few degrees below that.—*Lancet*, April 4, 1875, p. 340.

7.—ON THE USE OF QUININE AS A GARGLE IN DIPHTHERITIC, SCARLATINAL, AND OTHER FORMS OF SORE THROAT.

By Dr. DAVID J. BRAKENRIDGE, Assistant Physician to the Royal Infirmary, Edinburgh.

Since Binz published his famous experiments, showing the action of quinine on the white corpuscles of the blood, numerous authorities have confirmed and extended his observations. The following facts, among others, may now be regarded as established:—

1. Quinine is a protoplasm poison, and limits the number and movements of the white blood corpuscles and pus cells.

2. It prevents the pathological migration of the blood corpuscles into the tissues of the membranous and parenchymatous organs exposed to the air, both when it is given subcutaneously and when it is directly applied to the part.

3. It restrains the dilatation of the blood-vessels.

4. It is an antiseptic, and exerts a paralysing, or, in larger doses, a destructive influence on microzymes.

With these facts in view, the theoretical appropriateness of quinine as a gargle in diphtheria with abundant proliferation of micrococci, and in scarlatinal, and various other forms of sore-throat, especially when attended with membranous exudation, pultaceous secretion, or ulceration, is apparent. For it antagonises all the visible factors of such forms of inflammation.

Before employing it for this purpose, I was familiar with the use of solution of quinine as a dressing in bed-sores and other tedious ulcers. The marked diminution in the secretion of pus and the rapid improvement which I observed to take place in these cases when so treated, first led me to anticipate good results from quinine as a gargle.

For the last four months I have treated every suitable case of sore-throat that I have met with in my wards in the Royal Infirmary and elsewhere, with a gargle composed, as a rule, of two grains of sulphate of quinine and five minims of dilute sulphuric acid to each ounce of water. Sometimes I have been able to increase the strength; sometimes I have been

compelled to diminish it. When well tolerated, the stronger it is the better.

The results I have obtained fully confirm my favourable anticipations. From a considerable number of cases I draw the following conclusions:—

Simple non-syphilitic ulcers of the throat, under this treatment, at once assume a healthier aspect and heal rapidly.

In syphilitic ulcers, the local treatment has always been accompanied by the internal administration of iodide of potassium, or some other suitable constitutional remedy; but my impression is that, in these cases, the cure is hastened by the quinine gargle.

Its effect in the sore-throat of scarlatina is very marked, the pultaceous secretion being checked, and the inflammatory swelling diminished.

It is of comparatively little use in the early stage of cynanche tonsillaris, over which tincture of aconite, in minim doses frequently repeated, has so decided a control. When, however, abscess followed by abundant discharge of pus results, its beneficial influence in checking the suppuration and promoting healing is marked.

In the slighter forms of diphtheritic sore-throat it answers admirably, preventing the extension of the disease, and promoting the separation of the membranous exudation.

It is, however, in severe cases of true diphtheria that I hope it will prove most useful. I have now employed it in three cases of this disease, and in all the result has been highly satisfactory.

I select the following case, because it was one of unusual severity:—

Mrs. K., a widow, 25 years of age, previously healthy, passed an open drain on Feb. 5th; remarked the bad smell at the time, and said to her sister, "I am sure I have caught something." Complained of slight chilliness for several days until Feb. 9th, when she was seized with sickness, headache, vomiting, and rigors. Did not feel the throat sore until the 10th, on the afternoon of which day I first saw her. She was in the dining-room, dressed, and sitting on the sofa, and had a haggard and very anxious look. Pulse 140, very weak. Tenderness and swelling at the angles of the jaw, and down the lymphatic glands of the neck on both sides. Tongue furred, and breath very offensive. A foul, ragged, yellowish-grey patch, about the size of a florin, covered the right tonsil. The arch of the palate, uvula, and fauces were of a dark livid red colour. Ordered to bed, to take 10 grains of chlorate of potash every three hours, and to gargle the throat with Condy's fluid (a teaspoonful to a tumblerful of water) every

half-hour night and day. Milk, beef-tea, sago, and arrow-root to be taken freely.

Feb. 11. Less anxious expression. Pulse rather firmer, 120. Diphtheritic patch cleaner-looking and less offensive; but has extended about two lines up towards the uvula.

Feb. 12. A new patch has appeared on the left tonsil, and another at the back of the pharynx, and there is great pain in swallowing. Temperature 103°. Pulse 130. Bowels regular. Beef-tea and milk taken in considerable quantities.

Ten drops of tincture of perchloride of iron to be added to each dose of the chlorate of potash.

Feb. 13. Very great pain in swallowing, chiefly on the right side, left and posterior patches extending, right separating. Uvula still free. Temperature 102.2°.

Feb. 14. Still great pain in swallowing. Diphtheritic patches have extended considerably on the left side; that on the right tonsil has separated to-day. Pulse 120. Has been able to take a considerable amount of nourishment.

Medicinal treatment has been steadily carried out. Has slept between the periods of gargling pretty well up till to-day. Ordered three glasses of port wine in the day.

Feb. 15. Had a restless night. Great pain in swallowing, and the food returns partially by the nostrils. There has been a slight discharge from the nostrils, with tenderness, from the commencement of the disease; it is now sanio-purulent, and acrid. The diphtheritic membranes are still very firmly adherent, and are gradually extending. They now cover all the posterior surface of the pharynx, extending on the left side over the tonsil and left side of the uvula. The right tonsil is clean, tender-looking, and presents a cup-like appearance where the false membrane has separated.

The following gargle was ordered to be used alternately with the Condyl's fluid every half hour:—

Rx. Quiniæ sulphatis, gr. xviii.; acidi sulphurici diluti, ℥ xlii.; aquam ad ℥ vi. Misce.

This at first produced retching, and had to be diluted with an equal amount of water. A gradual return was made in a few hours to the full strength, which was afterwards well borne.

Feb. 16. Decided improvement. A good many portions of the false membrane have become detached during the night. Pulse 100, and of better strength. The tongue is cleaner, and the swelling of the throat is much less. The swellings at the angles of the jaw have quite fallen, and the throat altogether looks better. Patient attributes the improvement to the new gargle; has had a good night. She fancied and enjoyed a cup of tea this morning for the first time.

Nine o'clock p.m. A good many shreds of false membrane

have become detached during the day, and the whole affected surface looks healthier. Considerable pain attended the separation of the sloughs during the afternoon. Temperature 100.4°. Pulse 108.

From this date the throat symptoms steadily and rapidly improved; and on the evening of the 18th the diphtheritic false membrane—the last trace of which was seen in the forenoon hanging loosely from the posterior surface of the pharynx in the middle line—had entirely disappeared.

The paralysis of the veil of the palate, which commenced on Feb. 15, culminated in general paralysis of great severity and duration, from which the patient is only now (June 16) slowly recovering.

The intensity of the poison must have been great. On the first day of the disease, a little girl, residing in the house, was sent away to the village of Dunoon, on the Clyde, to be out of danger. She escaped herself, but carried the poison to a younger sister of the patient (Mrs. K.), who took the disease and died after six days' illness.

I have found the quinine solution useful as a wash in aphthæ, stomatitis, and other affections of the mouth; but my experience of it in these cases has been limited by the difficulty attending its use in childhood, owing to its very bitter taste.—*Practitioner, August, 1875, p. 110.*

8.—ON THE PATHOLOGY AND TREATMENT OF CHOLERA.

By Surgeon A. R. HALL, Army Medical Department.

[The following paper was read before the Royal Medical and Chirurgical Society, Oct. 13, 1874.]

The encouraging success that has attended the treatment of the cold stage of cholera by the hypodermic injection of chloral hydrate in the cases in which it has been tried, induces me to bring the subject before the notice of the medical profession in England. The fact that the Government of India attach so much importance to the matter as to have published letters from Mr. Higginson, the Civil Surgeon of Kheri, in Oudh, and myself, concerning it, in their official Gazette of Feb. 14, 1874, is also very satisfactory. These reports were published in a letter in the Times of August 15, 1874.

During a continuous service of upwards of eleven years in Bengal, I have seen a good deal of cholera. I have suffered from it myself; and I think it may be of interest to describe, as tending to throw some light on the pathology of the disease, what particularly struck me in my own symptoms, and the

conclusions I have drawn from them and from the writings of various authors.

While doing duty with troops who were suffering from an epidemic, in April 1864, I had a severe attack. The first thing that I specially noticed was the entire absence of all griping, colic, or straining, while the purging was going on. The stools seemed to be expelled by the contraction of all the muscular fibres of the intestines themselves, without any assistance from the abdominal muscles. I noticed that my pulse was hard and then small before it ceased to be felt at the wrist. But what struck me as curious was the fact that my heart was beating forcibly all the time! The absence of pulse therefore did not seem to me to be caused by exhaustion of the heart's power, or a tendency to syncope.

The cramps in my arms and legs were very torturing. There was total suppression of urine for about twenty-four hours. My voice at first was rather shrill and *squeaky* before it became what is called *sepulchral*. The rice-water evacuations were ejected at frequent intervals, and the vomiting was almost incessant. I craved for liquids, and drank cold water and soda-water for a time, only to expel them with a spasmodic rush. I did not experience any *nausea*; when the fluid reached the stomach it seemed to be expelled by the rapid contraction of the muscular coats of that organ. I am thankful to say no stimulants were given to me, and I lived through the attack. I retained my consciousness the whole time, and recovered without much secondary fever.

After this experience I naturally took more interest than ever in studying the disease. The writings of Dr. Brown-Séquard seemed to me to lead to the conclusion that *irritation* of the vaso-motor portions of the sympathetic nervous system would account for many, if not all, the symptoms of the collapse of cholera. When I read Dr. George Johnson's "Notes on Cholera," I felt convinced that the *asphyxia* produced by the contraction of the pulmonary arterioles was apparently the chief condition to be overcome.

Without indulging here in speculations as to what *causes* cholera, I think I may say that the comparative rapidity with which persons who survive an attack generally regain their health, tends to prove that no serious *permanent* changes have taken place, either in the blood or the intestinal canal. When oxygen can gain free access to the blood, and water is supplied in sufficient quantity, the blood seems to be able to perform all its functions properly. Dr. Parkes, years ago, denied that the turbidity of the rice-water evacuations was occasioned entirely by the presence of epithelium, and the recent investigations of Drs. Lewis and Cunningham, in Calcutta, confirm the denial.

We have then, apparently, to deal with some morbid influence which acts with fearful violence for a time. It often kills rapidly, but if the patient does not succumb, he gets well pretty quickly. The question is—What state is he actually in, and what can be done to keep him alive?

In May, 1869, I wrote a paper, entitled "Thoughts about Cholera," which was published in the *Indian Annals of Medical Science* for March, 1870. Some months previously, a number of printed questions had been circulated, to be answered by various medical officers in Bengal, in order that the different opinions held on the subject might be recorded. One of the questions was:—Does collapse depend upon paralysis of the sympathetic nerve? To this I wrote "No." Dr. Brown-Séquard sums up the results of his well-known experiments by asserting that the parts supplied by the sympathetic, when that nerve is *divided* (or *paralysed*), show: (1) Dilatation of blood vessels; (2) Afflux of blood; and (3) Increase of vital properties; while galvanisation of the nerve is followed by (1) Contraction of blood-vessels; (2) Diminution of blood; and (3) Decrease of vital properties. It seemed to me therefore to be more probable that the sympathetic nerve is in an *irritated* state, rather than paralysed.

I think that the different symptoms of the collapse of cholera lead to the conclusion that the morbid influence (whatever it may be) exercises a stimulating action on the vaso-motor portion of the sympathetic nervous system, producing increased heart action, contraction of the muscular walls of the arteries, and, at first augmented blood-pressure. The increase of arterial tension is first shown by a hard pulse. This afterwards becomes small, because there is very little blood in the artery. I am sorry that I have not been able to obtain sphygmographic tracings of the pulse as yet. Dr. Parkes has pointed out the frequency of copious micturition of limpid urine at this early period. This flow has been shown by Traube to be intimately related to high arterial pressure; but when the state of muscular activity passes on into cramp-like spasm, there is total suppression of urine. This is probably due to complete closure of the renal arterioles.

A sensation of burning heat at the epigastrium is often experienced in collapse. This may be due to a hyperæmic condition of the solar plexus. The condition of irritability of the sympathetic produces, through its vaso-motor nerves, spasm of the muscular coats of *all* the arteries of the body. *The heart contracts forcibly, but cannot dilate normally, its muscular walls being spasmodically affected.* This is a point that I wish to bring prominently forward. I believe that the irritation and hyperactivity of the vaso-motor portion of the sympathetic is so great that the *inhibitory* or *dilating* action of the vagus on the heart is not able to control it.

Dr. Aitken, noticing the appearance of the heart after death, as observed by Dr. Parkes, writes:—"The right side of the heart and the pulmonary arteries were generally filled, and in some cases distended with blood; the left side and aorta were generally empty, or contained only a very small quantity of dark blood; the left side evidently had received little or no blood, but had continued to contract, in some cases even violently, on the last drop of blood which had entered it." I fancy that both sides of the heart are influenced in the same way by the same causes, and contract violently. The left heart gets very little blood sent over to it by the right heart, in consequence of the contracted pulmonary arterioles, and is therefore comparatively empty; though, while life lasts, it must get *some* blood. The right heart gets a considerable quantity forced into it by the gorged vena cava and other systemic veins, but cannot send it into the lungs, also because of the contracted pulmonary arterioles. It is therefore full of blood, and is found so after death.

We have then, I presume, the following conditions:—At first increased blood-pressure, caused by the heart beating strongly, forcing the blood through contracted arteries. As the disease advances, the heart, though contracting forcibly, gets very little blood from the lungs, and therefore has only that little to send into the arteries. The systemic veins are gorged with blood, which occasions the *blue* colour of the face and surface of the body.

The peculiar choleraic voice is one of the first symptoms that attracts attention in this disease. One thing seems evident, that this peculiar voice does not depend on deficiency of air entering and leaving the lungs. If a cholera patient is desired to take a deep breath, he can generally do so. A considerable quantity of air is heard rushing into the thorax, and if one's hand is put to the mouth, the breath can be felt coming out pretty strongly, only very cold. I cannot help thinking that we must attempt to explain the existence of this voice by the effect produced on the larynx by the abnormal condition of the nerves which supply its muscles.

Violent cramps in the voluntary muscles are felt in most cases, which occasion the real pain in collapse. Dr. C. B. Radcliffe, in "The Dynamics of Nerve and Muscle," says that contraction of muscle is a temporary death. It is, in fact, an imperfect *rigor mortis*, which condition is seen so strongly marked in persons who die in collapse. The cramps in cholera may therefore be caused by the cutting off of the blood-supply to portions of the muscles by the contracted state of their arterioles.

The vomiting is apparently due to spasm of the coats of the stomach caused by the hyperactivity of its nerve-supply; and

the evacuations from the bowels may be the result of exudation from the distended venous radicles of the portal system, which partake of the general venous engorgement; for Niemeyer has shown that when the arteries are contracted there is venous distension. I am aware that many facts have been observed which go to prove that the rice-water fluid is the result of *secretion* and not of transudation. The celebrated experiments of Moreau bear particularly on the point. Lately, in this country, Dr. Lauder Brunton has been carrying out a series of experiments on the nerves supplying the intestines, some of which he was kind enough to allow me to witness, and for which I take this opportunity of thanking him. But time will not permit me to go into this question here, and I beg, for the present, to leave it an open one. It is clinically interesting to know that the purging is not accompanied by any of that pain known to us as *colic*. The intestinal activity of cholera is absolutely painless. The *packed* condition of the intestines (in which they are seen drawn back to the spine, and occupying much less space than usual in the abdomen), described by Sir William Gull and Dr. Baly, is probably produced by great contraction of *all* the longitudinal as well as the circular fibres. *But I look upon the vomiting and purging as of secondary importance.* The worst cases, those of so-called *cholera sicca*, appear to die of *asphyxia* before much fluid can be thrown out by the stomach and intestines; for though rice-water fluid is found in the intestines in these cases after death, there is nothing like the quantity that is often expelled during life in other and less severe cases. According to my idea, the morbid influence is expending its force most fatally on the heart and lungs, through the vaso-motor centres, and to these our whole attention must be directed.

It is also a matter of clinical fact that in the worst cases there is absolute suppression of bile secretion and urine. These facts point to the spasmodic condition of the arterioles of the liver and kidney. The blood is shut off from the liver cells and Malpighian tufts. The gall-bladder, however, is usually found full, or half full, after death. The general condition of spasm of the involuntary muscular system has probably involved the circular fibres of the bile-duct, and so prevented the bile (which had been secreted since solid food was last taken, and before the state of spasm had set in) from being poured into the intestines.

The urinary bladder is generally contracted to the "size of a walnut," as has been remarked.

It has also been observed that abortions frequently occur in pregnant women when attacked by cholera, and that the foetus has been often expelled *alive*, proving that the miscarriage was

not caused by the death of the embryo. Of course, the contracted state of the mother's blood-vessels may cause the death of the child in time by stopping the utero-placental circulation; but I fancy that the uterus often contracts before this is brought about.

One of the chief peculiarities about this disease is, that while such fearful disturbance is going on in the body, the intellect is generally unaffected. If there was really a tendency to syncope, we should probably oftener see loss of consciousness.

I now beg to bring forward what I consider to be the right principle on which to treat collapse of cholera. Presuming the morbid state against which we have to contend to be one of asphyxia, caused by spasms of involuntary muscular fibres, due to a condition of hyperactivity of the sympathetic nervous system, the logical inference distinctly points to the exhibition of a remedy calculated to neutralise this condition. Such remedies are to be found in the class of agents which directly depress the activity of the muscular fibres of the circulatory apparatus.

In my paper above referred to, I pointed out that it is no good giving medicines by the mouth, as they are generally immediately rejected. I suggested the *hypodermic injection of pure sedatives*, which, if given in sufficient quantities, actually do produce syncope by their palsyng action on the heart. When I wrote that paper chloral hydrate had only recently been discovered.

In India, medical men do not enjoy the same opportunities of getting the newest remedies and profiting by the latest discoveries as their more fortunate professional brethren in England. At that time I had never seen chloral hydrate, and did not know what its real therapeutic action was.

I enumerated the sedatives, as given in Dr. Headland's "Action of Medicines," which I thought might be useful, viz., tartar-emetic, ipecacuanha, digitalis, aconite, hydrocyanic acid, and some others. But tartar-emetic and ipecacuanha are too irritating to the *skin itself* for hypodermic injections, and digitalis has been proved by Dr. Milner Fothergill to be a direct cardiac stimulant. I procured Dr. Fothergill's essay in 1872, and Surgeon-Major Collis (of "The Buffs") and myself performed a number of experiments on bull-frogs about 1½ lbs. in weight, and twelve inches in length, with digitalis and other drugs, which produce an effect on the circulation through the nervous system. We found that chloral hydrate caused the death of the frogs, with the heart in the most *complete diastole*, thereby proving that it is one of the most powerful vascular sedatives that we possess.

It so happened that I had not an opportunity of trying the

hypodermic injection of a pure sedative till August, 1873. I then had a soldier in collapse under my care. I dissolved ten grains of chloral hydrate in 100 minims of water, and injected this quantity under the skin of the arms, in four different places. The record of this case will be found in the Indian Medical Gazette for November, 1873. Reaction was established in about five hours, and the patient made an excellent recovery, without any inconvenience from the punctures.

In September, 1873, Mr. Higginson, the Civil Surgeon of Kheri, in Oudh, treated nineteen cases on this plan, and only two died (one of whom might probably have been saved if the native doctor left in charge had carried out his instructions.) The letters preceding this paper refer to seventeen of these cases. These results speak for themselves. Of course a great many more cases will be required to prove the efficacy of this treatment, but at all events it is a good beginning.

I attach great importance to the strength of the solution used; one part of chloral hydrate to ten of water. If it is stronger than this it will probably not be absorbed into the blood, and only cause ulceration, or perhaps sloughing. Mr. M'Reddie, the Civil Surgeon of Hurdui, in Oudh, reported unfavourably on the hypodermic method, in the Indian Medical Gazette for December, 1872; but he dissolved twenty grains of chloral in sixty minims of water, which was much too strong.

I cannot here go into the subject of the secondary fever. I believe this to be a condition closely allied to heat apoplexy, and will only say that it would appear probable that the activity of the muscular walls of the blood-vessels is followed by a period of relaxation. This really is a partial paralysis, the result of exhaustion. In this dilated condition of the systemic arterioles, I have found quinine and a combination of stimulants and tonics to be the best treatment.

I hope now that I shall awaken sufficient interest in favour of the *sedative treatment of choleraic collapse*. When we hear sometimes of 80 per cent. of *those treated* dying, it is high time that some other plan than the usual stimulating one should be tried, and I believe that, practically, the subcutaneous injection of chloral hydrate is the best to adopt. All I ask for is a fair impartial trial. If this plan fails, it will share the fate of numerous predecessors; but if it really answers, and is proved to be a successful mode of treatment, it will not only save many lives, but will allay the sickening panic that spreads like lightning among a population when any of their number are stricken with malignant cholera, the greatest scourge of modern times.—*Practitioner*, July, 1875, p. 5.

9.—ON THE ORIGIN OF CANCER.

By the EDITOR OF THE MEDICAL TIMES AND GAZETTE.

Dr. Creighton's "Anatomical Research towards the *Ætiology of Cancer*," in Mr. Simon's late Report on Scientific Investigations, would appear to be one of the most important contributions that have been made for years on the subject of malignant growths. It is not simply that a number of new facts concerning cancer have been satisfactorily determined: the problem of the origin of the disease has been attacked from an entirely new side, and the significance of certain appearances that had not escaped the acute observation of previous pathologists has thus been discovered. Further, by judiciously employing his results, Dr. Creighton has been able to examine and discuss the present conflicting theories on the origin and nature of cancer; and to construct a theory of his own, which, without compromise in any form, has reconciled much that previously seemed irreconcilable.

It is well known that there prevail at present two leading theories of the origin of primary cancer. One of these, held notably by Waldeyer, represents cancer of epithelial structures as a growth of atypical epithelium; while the other, maintained especially by Virchow, rejects the epithelial origin, and assigns the origin of the epithelial-like cells of the tumour to an epithelial infection of the connective tissue. Again, with respect to secondary tumours—for example, in the liver—the current explanations of their origin may be said to be two: the first, that the new growth is due to the multiplication of cells that have migrated to the part; and the second, that it is due to the transformation of certain pre-existing elements of the organ. Virchow, as is well known, adheres to the latter view, and holds that the connective and not the parenchymatous element of the part is the one that is transformed. There are thus two distinct problems to be solved regarding the *ætiology of cancer*—the origin of primary, and the origin of secondary tumours. That the two problems are most intimately related to each other is immediately obvious; as it equally is that their solution will to a great extent answer the broader question of the essential nature of cancer.

The originality of the course pursued in the present research is here to be noted. Reversing the ordinary plan of investigation, Dr. Creighton began by selecting for examination not primary but secondary tumours. There are two advantages in this choice. The beginnings of primary tumours are most difficult, or even impossible, to discover, for their seat has too frequently undergone previous morbid alteration. Secondary

tumours, on the contrary, appear in organs, such as the liver, which are probably perfectly healthy otherwise. The tissue of these organs is a "neutral ground," on which the most various of malignant tumours may manifest themselves and display their characters; and further, especially if the liver is affected numerous separate nodules may generally be found, exhibiting every stage of development.

Dr. Creighton states, to begin with, that he uses the name "cancer" in the sense, which it conventionally conveys in this country, of malignant tumour. He then proceeds to describe the plan that he has pursued in the investigation, and the results that he has obtained from the microscopic examination of secondary cancer of the liver. These we shall now give as briefly as possible.

It may be stated in a single sentence that the liver-cells are found to be transformed into cancer-cells by a process of vacuolation of their protoplasm, with other associated changes. The process of vacuolation, which, according to Dr. Creighton, occupies such an important part in the development of secondary tumours, has long been familiar to physiologists and pathologists, although it is only within the last few years that it has attracted the attention that it deserves. Histologists have carefully described the appearance of a vacuole or cavity in the protoplasm of a cell; the lateral displacement or even disappearance of the nucleus; the disposition of the protoplasm as a distinct wall bounding the vacuole (often with a signet-ring appearance); and the development within the vacuole of various important contents, fluid or solid. Many of the first bloodvessels in the embryo are thus developed, the vacuole-wall remaining as the vessel-wall, the cavity constituting the lumen, and the contents the blood. There is also good reason for the belief that the nucleus-cavity of the ovum is an ordinary vacuole, and that the first changes on the fertilised ovum are vacuolation of the protoplasm and its results. Now, these changes in the ovum have been generally described as "endogenous cell-formation," and, as Dr. Creighton points out, this is but another name for vacuolation. Virchow demonstrated, years ago, the importance of endogenous cell-formation as contrasted with ordinary growth by division, and we will again refer to the significance of the two processes. More recently, since Cohnheim's great discovery of cell migration, the appearance of cells within a vacuolated or mother-cell has been otherwise explained. The view has been advanced that the contained cells have migrated into that position from without—perhaps from the vessels; and there is probably little doubt that this really may occur. The attractive speculation has hereupon been raised that wandering-cells, or at

least some wandering-cells, are spermatic in their nature and effects; that they wander like spermatozoa until they find a suitable soil; and that, making their way into the protoplasm, they fructify it, and so determine the changes which the cell subsequently undergoes.

To return now to the results of the present research. It was found by Dr. Creighton, on carefully examining a secondary nodule in the liver with the naked eye, that its section presented an outer zone of a different colour; this was bounded internally by the tumour-tissue proper, and externally by normal liver-tissue. This zone was found to be "liver-tissue in a state of vacuolation." Vacuolated liver-cells occurred in every stage of development, and with various contents. The position of the vacuole cells was *primâ facie* evidence of their relation to the formation of tumour-cells. But there was also particular evidence. The vacuole-cell either remained as a small, round, indifferent cell, which had occupied the vacuole-cavity; or it broke up in such a way that the peripheral thick mass became detached from the slender ring, the latter then atrophying, and the former remaining as a tumour-cell; or it became filled with a pale, granular protoplasm, constituting a tumour-cell. Now, all these cell-products of vacuolation were in relation both with the liver-cells and with the tumour-cells—in definite local relation with both. All the varieties were observed, as a rule, lying together, as well as giant-cells. Sometimes, again, the indifferent cells became connective tissue of one or other kind.

It cannot be denied that this is very powerful evidence in favour of an intimate relation between vacuolation and the formation of tumour-cells. Accepting it as sufficient, let us estimate the importance of the conclusion. Many years ago, Virchow, in speaking of cell-growth, introduced the terms *hyperplastic* (as a substitute for *hypertrophic*) and *heteroplastic*. He writes in the "Cellular Pathologie"—"Es sind in der Pathologie zwei gesonderte Typen der Neoplasie zu unterscheiden: der Wachsthumstypus und der Zeugungstypus." There is cell-formation by division, which is a hyperplastic process, the new cell being merely a repetition of the old; and there is endogenous cell-formation, which is a metaplastic process, the product departing from the type of the parent cell, and acquiring differential characters of its own. Now, in Dr. Creighton's cases, it "was found that the results of the vacuolation process in the liver corresponded with the results to be looked for from endogenous cell-growth." Among the resulting cells were found giant-cells, or spindle-cells, or columnar epithelium, each being different from the parent cell. "The law of the continuity of the tissues, which would

have been observed in the purely hyperplastic mode of cell-formation, was abrogated by introducing the factor of endogenous cell-growth." It is unnecessary for us to insist upon the importance of this conclusion. By the pathologist it will be eagerly received and tested; by the disciples of the school of Virchow it will be accepted with natural hesitation, for it must give a rude shock to the cellular pathology.

The question next arises, How is this process of endogenous cell-formation induced in the liver? There is abundant evidence that primary and secondary tumours bear a distinctly genetic relation to each other. The primary precedes the secondary in point of time; a remarkable family likeness can, in most instances, be traced between them; and, what is even more significant, the process of endogenous cell-growth, by which the secondary tumour is developed, bears a striking resemblance to the first changes in the ovum after impregnation. For these several reasons, it must be granted that the influence of the primary or parent tumour may be assumed in any attempt to offer an explanation of the origin of the secondary. This influence is extraneous to the seat of the secondary growth, and Dr. Creighton has shown that it operates by the mechanism of endogenous cell-formation. We cannot but acknowledge the remarkable fitness of the comparison which Dr. Creighton finds himself entitled to draw between this extraneous influence and a spermatogenic influence; while we confess with him that the manner in which it is produced by the parent tumour is unknown. On the whole, it must, we think, be allowed that Dr. Creighton has established his theory of the origin of secondary malignant tumours on a sound physiological basis.

The application of the theory does not stop here; it may be extended to *primary* cancers of epithelial parts. We have already given examples of the occurrence of vacuolation in the normal organism, and there are many more that may be adduced. Thus the salivary and mucous corpuscles, and, to speak more generally, all "goblet-cells" found on mucous surfaces, are probably products or stages of vacuolation. The product of the process is often fluid, and called a "secretion;" but it may be solid—for example, spermatozoa,—or both, as in most instances it is. In every case it may be considered as the result of an endogenous cell-formation, and so essentially heteroplasmic. The bearing of this conclusion on the question of primary malignant tumours soon becomes apparent. The fact that the product is in some instances solid or protoplasmic, and in others partly protoplasmic—as *e.g.*, in the colostrum-corpuscles—permits of the conclusion that "in the exercise of the glandular function there may be produced, on occasion,

from the epithelium, elements that are not themselves true epithelium, and that are, in fact, heteroplastic." We have already referred in the beginning of this article to the rival theories of Waldeyer and Virchow on the origin of primary epithelial cancer. There has been gradually accumulating strong evidence in favour of Waldeyer's view, that epithelium is the point of departure; but it has remained for Dr. Creighton to reconcile with this the firm belief of Virchow in "the primary heteroplasie of all cancers." Dr. Creighton has shown by the preceding argument, that the cellular product of secreting epithelium should probably be regarded as no longer epithelium, but a heteroplastic product, and that by virtue of the law of endogenous cell-formation.

Important as are the results that we have reviewed, they are manifestly but a small part of what may be expected from a thorough investigation, from the same point of view, of the different glands of malignant growths connected with them. Dr. Creighton has promised to publish the result of such a research on the mamma and mammary tumours, and we shall look with much interest for its appearance.—*Med. Times and Gazette*, Sept. 4, 1875, p. 268.

10.—CONTRIBUTION TO THE STUDY OF NON-CANCEROUS TUMOURS OF THE BREAST.

By Dr. CHARLES MONOD, Chef du Laboratoire de l'Hôpital des Cliniques. (Translated by CHARLES J. CULLINGWORTH, Esq., Surgeon to St. Mary's Hospital, Manchester.)

The anatomical diagnosis of true cancer of the breast is seldom beset with any difficulty. It appears most frequently, in fact, with characters precisely like those which it bears in every other region of the body; a fibrous framework, forming alveoli, in which are enclosed cells of variable form and size. Further, and upon this point we are wishful to insist, the constituent elements of the mammary gland, its *acini* and excretory ducts, disappear before the development of the cancerous tissue.

Nevertheless, in certain cases, where the entire breast is not yet invaded by the pathological product, gland-tissue can be met with intact at the borders of the tumour. With fortunate and sufficiently extensive sections, one may perceive, in fact, at one end of the preparation, cancerous tissue, recognisable by the characters enumerated above; at the other, some gland lobules of normal size and appearance. The neighbouring tissue, and this more and more as the seat of complete degeneration is approached, presents traces of a

manifest alteration, in which the first stage is an abundant cell-proliferation. Cell-elements appear on the field in increasing number and size. Here and there they form little groups, and are located between the bundles of connective tissue, which seem to open out for their reception. Here evidently is seen the first stage of the alveolar formation of the cancer. These rudimentary alveoli may sometimes only contain one or two large cells.

The lesion continuing its march of invasion, the cells continually increase in number and size, and the spaces which they occupy enlarge in proportion, and become more and more numerous. Little by little also the gland-lobules, hitherto intact, disappear, obliterated as it were by the march of the pathological process.

Thus the point is arrived at by degrees where the alveolar tissue of the cancer alone exists; the glandular tissue has entirely disappeared.

Quite different is the physiognomy of the non-cancerous tumours of the breast. Here the gland-tissue persists, altered in form it is true, but yet always recognisable by means of the regular epithelial coat which lines the enlarged gland-spaces.

This persistence of the gland-tissue explains the confusion into which many authors have been led, and the numerous cases described under the title of adenomata of the breast. We shall endeavour to show that the characteristics of these tumours must be sought for, not in the glandular element, always more or less perverted, but in the intermediate tissue; and that the exact analysis of that tissue alone permits us to define their nature with precision.

We are aware that this mode of meeting the question before us is not new, and has been already partially set forth in previous publications. Recent discussions, however, having shown that it was far from being sufficiently known and popularized, we have thought that it might perhaps be useful to take advantage of our personal researches, in order to bring it once more into prominence.

Non-cancerous tumours of the breast, clinically very different from each other, present certain common anatomical characters which allow of their being brought together, and show, on the other hand, important differences which justify the recognition of a certain number of varieties amongst them. Their physical characters are very variable, and in no way help to place them in distinct categories. It will be sufficient to remember in fact, that they include the largest and the smallest breast-tumours; that their consistence, which generally reaches neither the softness of encephaloid,

nor the hardness of scirrhus, may for the rest vary considerably; that their form is still less characteristic. Nevertheless, to the unaided eye, they all present one character in common, which has not escaped careful observers.

The fundamental tissue of the tumour, even when it appears at first dense and of homogeneous structure, is traversed by numerous clefts and furrows: some scarcely appreciable by the unaided eye; others quite visible and admitting a probe easily; others again, still more considerable, may open out into actual cavities of a cystic appearance, and of an elongated or rounded form. It is usually easy to make out that these cavities communicate with each other here and there; others, on the contrary, appear completely isolated. The largest often contain in their interior a mammillated projection in form like a mushroom, which seems to be developed at the expense of one of their walls. This projection itself presents a pinked or furrowed (*déchiquetée*) surface; it is subdivided into a great number of lobes, and smaller and smaller lobules, which give it a cauliflower aspect. The tissue of which it is composed, appears on section of the same nature as the rest of the tumour. Frequently, however, it is of softer consistence, and may even, according to the variety to which it belongs, be in process of softening.

We shall see presently that this papillary appearance, which only reveals itself to the unaided eye when these vegetations have acquired a large size, is found under the microscope throughout the whole of the tumour, in different stages of development, from the simple upraising of the cyst-wall to the completely formed papilla.

It is fully proved at this day that these hollow spaces, whose existence had not been overlooked by those occupied with the study of breast-tumours, are no other than the gland-cavities of the breast, abnormally developed and altered in form by the pathological tissue which has arisen in the gland. They have been described by M. Ranvier, under the name of *kystes lacunaires*, to distinguish them from true cysts, such as may be met with in tumours of the breast.

All these cavities present a perfectly smooth surface, which recalls in every particular the appearance of an epithelial surface. It is easy, indeed, to show that they are really covered by epithelium. For this purpose it is sufficient, if the tumour has been recently removed, to let fall into the cavity of one of these cysts a solution of nitrate of silver 3 parts to the 1000; when permeation has occurred, a thin fragment of the cyst-wall is placed under the microscope,

the section being parallel to the surface. An epithelial layer is at once recognised, in all respects similar to that which the wall of a normal gland duct would furnish under similar circumstances. This epithelium is found also on examination of thin sections under the microscope, made after hardening. These are the results furnished by this second mode of study, which we must now describe. We have no need to insist in this place upon the inadequacy of preparations obtained by the scraping of specimens in the recent state, or the crushing of small fragments torn from the surface of the tumour. By this means epithelial cells are easily obtained from the gland-ducts, often grouped indeed in a manner which gives a true cast of the culs-de-sac; and one is thereby led quite naturally to make an anatomical diagnosis of a glandular tumour or adenoma. The elements of the intermediate tissue between the culs de-sac most frequently in fact are overlooked by that mode of examination; either because being very firmly placed in the situation they occupy, they are less easy to remove by scraping; or because being less characteristic in form, they attract less attention.

An examination of the liquid collected by means of scraping (and particularly that obtained from a fragment which has been in Müller's solution for twenty-four hours) is not without its use. Only in that way can the elements of the tumour be observed in a state of isolation, and accurate ideas be gained with regard to their form and size.

But in order to form a complete anatomical diagnosis, the analysis must be carried further; it is not in reality the observation of the isolated elements of a tissue, but of their mutual arrangement, which will permit us to come to definite conclusions as to its nature. The examination of thin sections taken from a mass suitably hardened, and coloured in the ordinary way, ought then always to follow that of the tumour in its recent state. After colouring similar preparations with the picro-carminate of ammonia, an arrangement at once strikes us which recalls and explains what had been noticed during the examination of the tumour with the unaided eye. We see at the first glance, with a low power, that the pathological tissue is traversed by numerous cavities or empty spaces, bordered by wavy lines of a deep red colour, contrasting by their staining with the surrounding parts. With a higher power it is easy to note that these deeply-coloured lines, which form the borders of the hollow spaces in the tumour, are composed of prismatic epithelial cells, in regular rows and in a single layer. These hollows and epithelial surfaces evidently correspond to the more or less altered glandular structure of the breast. It is indeed possible to perceive by the side of hollow spaces of

considerable diameter, where it is difficult to recognise the proper structure of the transformed gland, true gland-tubes which have preserved their normal texture and appearance, presenting themselves in the form of longer or shorter ducts, without any appreciable cavity, owing to the exact apposition of their opposite walls, and dividing several times at one end, recalling in short the aspect of a glandular canal leading to a vesicle (*acinus*). At other times the tube-walls are separated from each other; they then appear elevated by more or less numerous *papillæ*, as if the surrounding tissue were trying to force its way into their cavity.

Lastly, these glandular spaces have, further on, become quite unrecognisable; partly on account of the enormous dilatation they have undergone, and partly on account of the existence in their interior of projections of gradually increasing size. The presence of the epithelium above described is the only point in common which unites them together, and allows these diverse forms of the same lesion to be approximated.

Between these three every intermediate degree may be observed, differing one from another only in the greater or less dilatation of the cavities, or the more or less considerable budding of the walls. This appearance, with differences of detail, may be found in tumours which, as we shall show immediately, are yet of an entirely different nature. Nevertheless, one may say in a general way, that the more rapid the development of the tumour has been, or the more remote the examination from its commencement, the fewer gland-tubes of nearly normal aspect will one find, the more considerable, on the contrary, will be the hollow spaces and the budding of the walls.

Finally—and this is the point upon which we are chiefly wishful to insist—it follows from these facts that, as we have indicated above, it is not in the glandular element that the distinctive characters of the different tumours of the breast ought to be looked for. These distinguishing characters can only be found in the stroma intervening between the gland-vesicles and the dilated excretory ducts, in the tissue which constitutes the walls of the hollow spaces, or the buds which project into their interior. This tissue, in the preparations that we have examined, has appeared sometimes with the characters of fibrous tissue, either completely formed or more frequently young, and abundantly supplied with cell elements; sometimes presenting in every particular the characteristics of sarcomata and myxomata when developed in any other part of the body.

We shall not insist upon the histological differences which

separate these three varieties of pathological tissues. In certain cases some difficulty may be experienced in distinguishing them one from another; in tracing, for example, a well-marked line of demarcation between fibrous tissue in course of development and true sarcomatous tissue; besides, mixed forms will occur, in which there will be a mixture, often in unequal proportions, of sarcomatous and myxomatous places. The study of these questions belongs to the anatomical diagnosis of tumours in general.

The important point, if our way of understanding the mode of constitution of the tumours under consideration is correct, is that, each one presenting a common point of structure—the alteration of the gland-ducts, and each offering, on the contrary, a distinctive character—the mode of constitution of their stroma, it is evidently according to the nature of this last that they must be distinguished, and consequently named. In one word, they must be considered as *fibromata*, *sarcomata*, or *myxomata* of the breast, and not as more or less altered *adenomata*.

Nevertheless it does not seem to us to follow from the facts we are here stating, that the notion of a concomitant glandular hypertrophy must be altogether discarded. Increase in the number of the *acini* is possible, and even probable. If on the one hand, indeed, the small proportion of the glandular element of the breast in that of a young woman, who has had no children, and especially of one who has not suckled, be taken into account; and, on the other hand, the large number of dilated and altered *acini* met with in little fibrous tumours of the breast, developed under the same circumstances—one is forcibly led to admit that a process of hypertrophy in the gland itself has accompanied the formation of the neoplastic tissue in the intervening stroma. But, to repeat it once more, it is not in that alteration that the characteristic of the lesion must be looked for, because it is found with analogous characters in tumours of different kinds. In support of this view an argument may be adduced, already put forth by MM. Cornil et Ranvier in their “*Manuel d’Histologie Pathologique*,” and drawn from the examination of tumours of this kind, returning after removal. The new tumour no longer contains gland-tissue; an evident proof that, in the primitive tumour, the glandular hypertrophy constituted a simply accessory element.

To sum up, if it is sought to give an account of the mode of general development of these tumours, it may be granted that there is formed in the interlobular tissue, following the same mechanism as in the connective or fibrous tissue in any other part of the body, a neoplastic tissue, which assumes, according to the case, the characters of a fibroma, a sarcoma, or a

myxoma. At the same time, and probably on account of the irritation in the neighbourhood, the *acini* of the gland hypertrophy, increase in number and size; they are, so to speak, thrust into prominence (*etales* and altered in form by the processes set agoing around them. The cavities limited by their walls constitute spaces perfectly available, where the newly-formed tissue tends to develop at ease in the form of buds and *papillæ* which project more and more into their interior. In this respect these tumours may be compared with those which develop in other cavities of the economy, and which generally show also a tendency to assume this budding and papillary form. We know, indeed, the frequency of papillary growths in the bladder, in the rectum, in the mucous membrane of the mouth, tongue, larynx, &c. Here too the anatomical form is similar in every case, as is indicated by the generic term *polypi*, under which the greater part of these cases have long been confounded. A more exact examination has since proved that, in cases of that kind, we may have to deal with tumours essentially different the one from the other.

Non-cancerous tumours of the breast generally present themselves under two leading forms. In the one, the tumour, generally small, is traversed by the narrow clefts we have described, but of true cystic cavities it presents few or none: in that case it turns out generally a fibroma of the breast, but occasionally also a sarcoma. This last fact explains the recurrence of tumours apparently 'benign, their growth becoming suddenly rapid, or yet again their pretended cancerous transformation. In a second form, cystic dilatations, often of considerable diameter, predominate (cysto-sarcomata); the tumour is usually large, it is accompanied sooner or later with ulceration, or rather perforation of the skin, through which a fleshy-looking granulation appears. These two forms are referable however to one fundamental type; they constitute a natural group of tumours, which, for the anatomist and the clinical worker (*clinicien*), deserve to be separated from cancer. Attentive observation of the stroma will also permit their being divided into a certain number of varieties, important to be distinguished from the double point of view of anatomical diagnosis and exact prognosis.

We have only had in view, in these observations, the *papillary* forms of the non-cancerous tumours of the breast, which are the most frequent. We know that they may assume another form, that of fibromata, sarcomata, and myxomata *en masse*. We have had no opportunity of observing them, and in regard to them we confine ourselves to this simple mention.—*Obstetrical Journal*, April, 1875, p. 2.

11.—THREE CASES OF ACUTE ARTICULAR RHEUMATISM
PRESENTING ANOMALOUS SYMPTOMS, AND REQUIRING
AN UNUSUAL COURSE OF TREATMENT.

By Dr. JAMES F. DUNCAN, President of the King and Queen's
College of Physicians in Ireland, &c.

[All the three following cases, whilst they presented the ordinary features of acute rheumatism, had these peculiarities—marked pain and tenderness affecting some part of the spinal column and all absence of acid reaction of the urine.

Case 1.—The urine was neutral in reaction with a considerable deposit of a white appearance which was taken to be phosphatic. There was no improvement in the case under the treatment adopted.]

Feb. 14. The muriated tincture of iron was substituted in his mixture for the dilute muriatic acid. From this date there was a steady and marked improvement; he was nearly entirely free from pain and swelling of the joints on the 18th, but the urine continued to exhibit a neutral reaction until the 20th, when it resumed its normal acid character, which it retained afterwards as long as he was under treatment.

Feb. 23. There was some return of pain in the left elbow, but there was no swelling or redness of the joints. He was taking his iron mixture, but not regularly, and his pills of quinine and opium had been left off for some days; both remedies to be resumed.

Feb. 25. The pain had moved to his left shoulder; he had been guilty of indiscretion in his diet, which probably was the cause of the return.

The same treatment was continued; the pains were afterwards trifling in amount, his appetite increased, his general health improved, and he left the institution convalescent on the 12th March, 1875.

Case 2.—Mr. H. G., a clerk in the Bank of Ireland, was admitted to the Maison de Santé on the 19th February, 1875, labouring under acute rheumatism from the 13th of that month. He attributed his illness to having got his clothes wet when going to one of Moody and Sankey's meetings, and sitting in them for a couple of hours before his return home. He had been under treatment in his lodgings, under the care of a very respectable medical man, previous to his admission; he stated that the treatment employed for his relief was the exhibition of alkalies. His suffering was extreme, and it was with great difficulty he was carried upstairs to his room from the cab which conveyed him to the door. On testing his urine it was found neutral in its reaction; there was not much swelling of the affected joints, but there was acute pain, and there

was considerable tenderness of the lower portion of the dorsal spine when the part was examined. Owing to the similarity of his condition and symptoms to that of Mr. L., the treatment which had been found beneficial in his case was immediately directed for Mr. G.—namely pills of quinine with opium and belladonna, one every third hour; diluted muriatic acid in a mixture, one drachm to eight ounces, an ounce every third hour; arnica paint to the painful parts, and the affected limbs to be swathed in French wadding, covered with oiled silk.

The next day, Feb. 20th, there was considerable improvement; the pulse had fallen to 84; the tenderness along the spinal column was diminished, pain was confined to the left knee, and the appetite was improved; only the urine remained neutral.

Feb. 21. The pain had left the left knee, but it had seized the right wrist. The urine was neutral, with a considerable brownish deposit through it; he had slept badly, but his appetite was good; the pupils were natural in appearance.

Feb. 22. Very much better in every way; had his medicines every second hour; urine still neutral.

Feb. 23. Complained only of a slight pain in left elbow; pulse 72; urine neutral.

Feb. 25. Urine for the first time exhibited an acid reaction; he complained only of a little pain in the right groin.

March 1. Convalescent.

March 6. He had a return of his pains in right instep and knee, and behind his thigh. He had been allowed a little indulgence as to the use of grapes, oranges, and other articles of diet, which some friends supplied him with, and had exceeded the quantity permitted; this was probably the exciting cause. I ordered him a mixture containing calcined magnesia and colchicum, but the next day his pains returned with great severity; his appetite was defective, and his urine again exhibited a neutral reaction. He was then put upon the tincture of iron, with quinine in mixture, and his former pills were resumed.

March 8. The urine was this day acid; there was still some pain and tenderness over the lumbar vertebræ, but nothing to signify, and his general condition was much improved. As he was anxious to take advantage of a short leave of absence, which had been granted to him for the purpose of going to a friend's house in the country, he left the institution the next day. I have since seen him at his office perfectly free from all his ailments.

Case 3.—Mr. M., aged 23, admitted to Charlemont-street on the 8th of March, 1875, labouring under acute rheumatism. He stated that he took cold about three weeks previously, and

that for the last week of the time he had been afflicted with pains in one or more joints of his body. I saw him on the 9th; at that time his right shoulder was principally affected; his pulse was 100 and feeble; a sour smell exhaled from his person; his urine was of a reddish colour, as if it contained blood, and the reaction was very faintly acid. He was ordered a diaphoretic mixture, with pills containing one grain of blue pill and half a grain each of opium and colchicum; one to be taken every third hour.

March 10. He was more feverish, eyes heavy; his pains had attacked the left side of his body; his tongue was moist and clean at the edges, but furred in the centre; his pulse was 108; the urine not so deep in colour, with the same faint acid reaction. He was ordered to stop the mercurial and opium pills, and to take others instead, containing one grain each of sulphate of quinine and opium, and one quarter grain extract belladonna every third hour, with lemonade for drink, continuing the wadding swathe.

March 13. He was rather better, tongue was cleaning at edges; pulse 100. He was still perspiring, but the urine, which was scanty, had now a neutral reaction. He was ordered to continue his pills, and to take the muriatic acid mixture, one drachm and a half in eight ounces; one table-spoonful every third hour.

March 14. He had taken only two ounces in all of his mixture, but he felt himself better. Slept well the previous night. His pulse was 96, but the urine was still neutral. He was directed to take a wineglassful of his medicine for a dose.

March 15. His pulse was 88; his tongue cleaner; the temperature of his body had fallen considerably; his perspiration was nearly gone; his pains were much easier, and he was able, for the first time, to sit up in bed with a bed-chair supporting him. His urine came more freely, and without inconvenience, but it was perfectly neutral.

March 16. His pulse was 80; tongue cleaner; urine still neutral. Pain relieved, confined to his left wrist, but it was more a stiffness than a pain. His bowels were opened yesterday by an aperient draught.

March 17. Pulse 80. Pains diminished; could move his arms with freedom; urine still distinctly neutral.

March 18. Urine acid for the first time. Pains have left his left shoulder, and have attacked slightly his right one; attributes the change to cold from exposure in the night. The dose of his mixture was reduced one half owing to the change in the condition of the urine.

March 19. Urine again exhibited a neutral reaction. There was perceptible some remains of the sour smell from his perspi-

ration. His pains were considerably relieved, but traces of them were complained of in his left shoulder and right wrist. He was up yesterday. To resume his former dose of the acid, but not to do so until his bowels were moved by aperient pills, containing blue pill and comp. rhubarb pill.

March 20. Bowels were not moved; has had none of his mixture in consequence. Pains are much worse; right wrist swelled. To have an aperient draught and his mixture again, whether any action of the bowels followed or not.

March 22. Bowels were moved after a second dose of the medicine. The urine is again acid in its reaction; marked improvement in his condition; able to move his fingers and hands freely.

March 23. His pills were omitted yesterday. Had not so good a night. Complained of great pain over the sacrum; also of a slighter pain in right hip and left elbow; his arms and fingers were quite free. Medicine continued.

From this out his progress towards recovery was steady and satisfactory; the pain and tenderness over the sacrum disappeared on the 25th, and on the 29th he was discharged well.

At the time I resorted to the foregoing treatment I was not aware that any other practitioner had been led to adopt a similar course, and it was only after the present paper was drawn up that I found, on consulting some books of reference, that Dr. J. Russell Reynolds, in 1869, had published some cases in the *British Medical Journal*, in which he had used the muriated tincture of iron in large doses, with very decided benefit. In two of these the condition of the urine is stated to have been alkaline, but no information upon this point is given as to the state of that fluid in the remaining six. In fact he was induced to resort to this remedy, not from any theory as to its effect upon the renal secretion, but simply from analogy, because of the marked benefit derived from its use in erythema and erysipelas. It is quite possible that this medicine may have a wider range in its application in this disease than I am at present disposed to allow; but I think the fact that we may have acute rheumatism in patients in whom the urine is not acid in its reaction is a point worthy of serious attention, and one which should lead medical practitioners carefully to examine its condition in all cases, and to shape their treatment accordingly. There can be no question that whatever part the administration of the hydrochloric acid played in the instances under review—for it is freely admitted that the adjuncts of the treatment may have had a good deal to do with the quickness of the termination—it certainly was productive of no injury; on the contrary, everything led me to believe that it really had a good deal to say to the relief of the patient, and that the

larger the dose, and the shorter the interval in the administration, the more striking was the benefit. The dose Dr. Reynolds gave was 30 minims of the perchloride in the two first cases every sixth hour, and 40 minims in the remainder, and he states that the relief was most marked in its character, that the pain was lessened in one day in four cases, in two days in three, and in three days in one; the temperature was reduced with similar rapidity; and he sums up by saying that there was an entire absence of discomfort from taking the medicine; there was no head-ache; the tongue cleaned; the feelings improved, and that the cases terminated favourably in all within the short period of fifteen days. I omit from this enumeration one of his cases which was complicated with cerebral symptoms, and in which the patient died comatose.

The progress of animal chemistry in modern times has so deeply ingrained into our minds that the cause of acute rheumatism is the preternatural presence of lactic acid in the system, and that the proper antidote for this is the administration of some suitable alkali, that it requires, I am afraid, some effort on the part of my hearers to be convinced that there has not been some mistake committed here either in determining the nature of these cases, or observing the effects of the treatment; and I confess that, judging from my own feelings in the matter, incredulity under the circumstances appears not only pardonable but justifiable. If, however, the statement of facts as they have occurred shall have the effect of stimulating my brethren to a closer observation of facts, and to a more searching inquiry into the effects of remedies, good will be accomplished, whether the view here put forward be established or overthrown.—*Dublin Journal of Med. Science*, June 1875, p. 502.

DISEASES OF THE NERVOUS SYSTEM.

12.—NITRITE OF AMYL IN FACIAL NEURALGIA.

By Dr. GEORGE H. EVANS, Assistant Physician to the Middlesex Hospital.

Finding that one of the uses of nitrite of amyl does not seem to be as generally known among the medical profession as it should be, I think it may be worth while to put on record the few cases of this use of the drug that have come under my notice.

It occurred to me about three years since, on first becoming acquainted with the effect of inhalation of nitrite of amyl, which was then said to flush the small vessels (first of the face

and then of the trunk) by paralysing the vaso-motors, but which at all events caused flushing of the face, &c., that it might possibly give relief in some of those cases of facial neuralgia which are obviously connected with, if not dependent on, anæmia. A case occurred which gave me an opportunity of testing this. A girl applied at St. Thomas's Hospital one Thursday morning about 11 a.m., trying to get some relief for neuralgia, which had prevented her (she said) from sleeping since the previous Saturday. She was evidently in considerable pain, and markedly anæmic. Hoping for a possible immediate effect, I made her inhale some nitrite of amyl. It took rather a longer inhalation than I expected to produce the usual flush: however, it came, and she then said that she felt a throbbing and a beating in her head, but that the pain was subsiding. In a very few minutes she said the pain had left her. I was very doubtful about the amyl producing anything more than simply temporary relief, so I told her to come again if the pain recurred. She did not come again to me; but she attended Dr. John Harley (she was already an out-patient under him) on the Saturday, and said she had had no pain since the inhalation. I did not see her again.

The next case in which I used it for this purpose was that of an anæmic young woman who was in St. Thomas's Hospital with acute rheumatism, and who during her convalescence suffered much from facial neuralgia, which she said had tormented her since childhood. On her the inhalation of amyl did not produce quite so striking an effect as on the former patient; but it invariably gave her relief, so much so that she said: "I wish you would let me take that little bottle out with me; I have tried all sorts of things, and never found anything do me so much good as that."

The third case I have to mention is that of a young lady who was, in September last, suffering from very severe neuralgia, whom I knew to be generally anæmic and whom I noticed to be much more anæmic than usual at that time. She told me she was always paler when these attacks came on. I gave her some amyl to inhale: it was some time before it produced any effect, visible or otherwise; but as soon as it had produced a slight flush, she said the pain was relieved. I saw her three weeks later, and she told me that she always prevented the attacks of neuralgia by inhaling amyl when she felt they were coming on. One of her sisters, who was not anæmic, incautiously one day sniffed at the amyl bottle, probably because I had especially cautioned my patient against allowing any of her sisters to use it; and immediately her face became most painfully flushed, and she felt sufficiently uncomfortable to prevent her repeating the experiment. I

think, from what I have seen of its use, that anæmic people (as one might expect) can bear very much larger doses of nitrite of amyl than those who are not anæmic.—*Practitioner*, Sept. 1875, p. 179.

13.—ON GELSEMINUM SEMPERVIRENS IN THE TREATMENT OF ODONTALGIA.

By Dr. JAMES SAWYER, Physician, to the Queen's and Children's Hospitals, Birmingham.

I desire to record my testimony in favour of gelseminum as a remedy for odontalgia. The drug is not very generally known to English practitioners, although it has been long in use in America.

Gelseminum sempervirens, the yellow jasmin, or woodbine, belonging to the natural family *Apocynaceæ*, grows plentifully in the Southern States of North America. The root, the part used in medicine, is sent to England cut up into small pieces, and these are of a brownish colour externally, of a greyish colour on section, from half an inch to two inches in length, and about a quarter of an inch in thickness. Several fatal cases of poisoning by gelseminum have been recorded. Death seems to have arisen from asphyxia, resulting from paralysis of the respiratory muscles. The drug appears to act mainly upon the nervous system, impairing the sensibility of the sensory nerves.

The dose of the powder of the root is from one to two grains. I have always used a tincture prepared according to the following formula, for which I am indebted to Mr. Dewson of this town:—Take of gelsemin root, in coarse powder, two ounces; of rectified spirit twenty fluid ounces. Moisten the powdered root with ten ounces of the spirit, and allow the mixture to stand for twenty-four hours. At the end of that time pack in a percolator, and add the remaining ten ounces of spirit. When the fluid has ceased to flow, remove the contents of the percolator and press them. Add the pressed liquid to that obtained by percolation, filter, and make up with rectified spirit to a pint. Eleven minims of the tincture are equal to about one grain of the root. The tincture contains only a trace of tannin, and may be given with any of the preparations of iron.

I have rarely found gelseminum fail to give decided and lasting relief in cases of neuralgic pains in the face and jaws, associated with carious teeth. I have usually given fifteen minims of the tincture every six hours.—*Practitioner*, August, 1875, p. 115.

14.—ON SOME CASES OF SYPHILITIC NERVOUS DISEASE.

By Dr. J. DRESCHFELD, Lecturer on Pathology, Owens College; Assistant Physician, Manchester Royal Infirmary.

Amongst the affections of the nervous system, those due to syphilitic lesions are certainly the most interesting, as well from a clinical as from a therapeutic point of view; for while on the one hand the lesions occurring in the different parts of the nervous system give rise to the most varied symptoms, an antisyphilitic treatment, on the other hand, is in most cases, especially where the specific lesion has not in its turn caused irreparable secondary degenerations in the nervous substance, followed by the happiest results. Though the more exact study of these diseases dates not many years back, the number of well-observed cases on record has already reached several hundreds; a perusal of the different treatises, such as those of Hughlings Jackson, Buzzard, Broadbent, Wilks, and others, will however show that many cases, before they came under these observers, had been allowed to run on for a long time without being recognised, and without any specific treatment being attempted; one chief reason perhaps being the now well-established fact, that where the syphilitic poison selects as habitat the nervous system, we have often few, if any, secondary symptoms. As a small contribution, therefore, to this very important and highly interesting chapter, I beg to give an account of several cases observed by me, which particularly illustrate the varying of the symptoms according to the seat of the lesion.

Case 1.—Emma H., aged 28, single, domestic servant, was sent to the Infirmary as an urgent case of brain fever, and admitted under my care (in the absence of Dr. W. Roberts) on April 22, 1874. I saw the patient on the morning following. Without being comatose, the patient was apathetic and taciturn, complaining only of a great pain at the back of the head. From her mistress, who had accompanied her to the hospital, we gathered that she had complained for a fortnight of great pain in the head; this was accompanied by a weakness in her right arm and leg, which increased to such an extent that she was obliged to take to her bed four days before admission; the day before admission the headache got much worse, vomiting came on, and she felt so prostrate that the family medical adviser sent her to the hospital.

The patient is of middle height, dark complexioned, and of sallow hue; her skin hot and perspiring freely; temp. 101·5°, pulse 110, resp. 24 per minute. No nodes on any part of head or body; no rash or cicatrices on the body; the pupils a little dilated, equal and reacting to light; hearing good; speech

has nasal character, as if some defect in palate; no paralysis of the oculo-motor muscles; no facial paralysis; tongue put out straight, moist, covered with a thin fur. Bowels had acted several times during the night (patient had received a saline mixture on admission). Urine high-coloured, sp. gr. 1022, no albumen, abundant phosphatic deposit. Physical examination of chest and abdomen reveals nothing abnormal. Spine not tender on pressure; the right arm and right leg completely paralysed. No wasting of right side. Sensibility on right side intact, likewise electro-contractility and electro-sensibility, and sensibility to pain and to temperature. The left arm and leg in no way affected. Total loss of appetite; great thirst.

The age of the patient, and the hemiplegia preceding the purely inflammatory symptoms of the meninges, made me at once suspect a specific cause, and I prescribed 10 grs. of pot. iod. pro dos., together with cold applications to head.

April 23, Evening. Patient in about the same condition. Pulse 112, temp. 100·8°

April 24, Morning. Patient passed a very bad night. She had been very restless, tossing about in bed, and delirious; complains of most violent pains in head; pulse 100, temp. 101°. Mr. Windsor kindly examined the eyes, and found the fundus normal. On examining the throat, the soft palate is found to be altogether absent, likewise the right tonsil. The pot. iod. was increased to 20 grs. pro dos., pil. Plummeri (gr. v.), one every two hours.

Evening. Patient worse; semi-comatose; passes fæces and urine involuntarily; twitchings of muscles of left side; pulse thin, 108; temp. 101·6°; resp. hurried and shallow. Treatment continued; mercurial inunction applied to both legs.

April 25. Patient considerably better; her features present a more cheerful aspect; has no recollection of what happened during the last twenty-four hours; pulse 100, temp. 99·6°. Is able to use her right arm and leg a little; pain in head less severe; complains of pain in throat; paralysis of the sphincters continues. Treatment continued; chlorate of potash gargle. Patient is now for the first time able to give her history. Has enjoyed good health, till twelve months ago she suffered from headache, rash, and sore throat, the throat continuing to remain sore for several months; for the last two months suffered from pain in head, which was worse at night; a fortnight ago began to lose power in right leg and arm, which increased till that side was rendered perfectly useless.

April 26. Improvement continues; temp. 98·6°, pulse 80; has now control over the sphincters.

The headache and hemiplegia from this time improved rapidly; she continued to take the pot. iod. and the mercury,

and the induced current was applied to the right leg and arm. She was sent to the Convalescent Hospital on May 16, preserving as the only remains of her illness a slight dragging of right leg; she stopped for three weeks at the Convalescent Hospital, when she left, the dragging of right leg still persisted, and I have heard nothing further from her since.

There can be no doubt that we had to do here with a case of syphilitic meningitis; the case, however, is instructive in several respects. The syphilitic disease ran its course in a very short time, and within twelve months from the first appearance of the secondary symptoms we witnessed the destruction of the soft palate and the right tonsil, and the advent of the graver nervous lesions, which began with intense headache and right hemiplegia. As regards the nature and seat of lesion, it is more than probable (from the fact that the nervous troubles came on soon after the syphilitic infection, that the symptoms were ushered in by great headache, that the development and disappearance of the symptoms were very rapid, and that the other symptoms pointing to a gummatous tumour of the brain were absent) that we had here at first a diffuse inflammatory disease in a cranial bone of the left base, which by its compression of the right motor tract gave rise to the hemiplegia, and which by its extension to the coverings of the brain brought on the general meningitis. A peculiarity which is noticeable in this case is the relation of the pulse and temperature to the general symptoms, the temperature being much lower and the pulse showing besides a greater constancy than is found in simple meningitis. In a case somewhat similar, but much slighter, quoted by Poncet (*Annales de Dermatologie et de Syphilographie*, 4^{me}. année, No. 3), the temperature ranged between 98 and 99.7°, and the pulse never exceeded 92. Should this be found constantly we should have another important aid in distinguishing syphilitic from simple meningitis. The paralysis of the sphincters marked the gravity of the case (in the lighter forms of cerebral syphilis, constipation and slight retention of urine are generally observed); for, as in all other nervous affections, they occur in syphilitic nervous diseases in the last stage, and out of twenty-five cases, which I collected from different authors, where there was such a condition of things, sixteen terminated fatally.

If for a moment we consider the different aids we have in diagnosing the syphilitic nature of a nervous disease, we have the following:—

1. Age of patient. The age of persons affected with syphilitic nervous disease ranges between 25 and 40; out of ninety-six cases collected by Braus, sixty were of patients between 20 and 40 years old; and the cases given by Broadbent, Buzzard, and others exhibit the same proportions.

2. A syphilitic history. We have here to bear in mind that it is often difficult, especially in women, to trace such a history; that often when the syphilitic virus selects for its locality the nervous system, there are few, if any, secondary symptoms; while, on the other hand, nervous troubles coming on in a syphilitic patient may be simply due to a coincidence. On looking over many recorded cases, I find that certain forms of syphilitic nervous disease are much oftener preceded by well-marked secondary symptoms than others: this, for instance, is true for syphilitic epilepsy and the more acute cases of meningitis which come on soon after infection.

3. Multiplicity of lesion. Nervous symptoms which can only be accounted for by the assumption of separate pathological products situated in different parts of the nervous system are almost always due to syphilis.

4. Absence of other causes. This applies particularly to the paralysis of the different cranial nerves, and to sudden attacks of hemiplegia in young persons, in the absence of any cardiac or renal troubles.

5. Influence of antisyphilitic treatment. In a great many cases, especially where the course of the nervous disease is acute, and where the patient has not previously undergone an anti-syphilitic treatment, the effects of the iodide and the mercury are very marked. In the more chronic cases, however, where the syphilitic deposit has itself undergone degenerative changes, and has established secondary changes in the surrounding nerve-matter, the treatment will of necessity be of little avail.

Having diagnosed a nervous lesion to be syphilitic, it becomes then of some moment to determine the exact nature and seat of the affection. This, though important as regards the prognosis of the case, is of no great weight as regards the treatment. I hope, however, at a future period to refer to this point also.—*Practitioner*, May 1875, p. 343.

15.—TREATMENT OF CHOREA BY ARSENIC.

By GEORGE GASKOIN, Esq., Surgeon to the British Hospital for Skin Diseases.

Perceiving a renewed attention bestowed on the treatment of chorea by means of arsenical preparations, I would add a few words to a subject which is only slightly referred to in my recent work on Psoriasis. How is it to be explained that this remedy, which has been pronounced to be infallible, or nearly so, by very competent physicians, should now hold scarce a second place? This I attribute to the faltering and confused recommendations found in medical works, or rather, in educational works on medicine, which results in a mixed treatment

being adopted for chorea—a sort of compromise between opposite extremes. We are not even yet emancipated from the exaggerations of Hamilton as to the efficacy of purgatives in the treatment of chorea, as found in his work on Purgatives, or from the effect of the still more extraordinary statements of Parr in the beginning of the century, as seen in his Medical Dictionary. At the very least, the modern treatment is begun by purges, which are generally so thorough as to add both to the intensity of the disorder and to the difficulty of its cure; and, besides this, the course of arsenic will be more than once interrupted to give another purge to the patient, which only serves to aggravate the complaint in its general features. True, we consider it one of debility; but, in the works referred to, we are not warned against increasing that debility, even if the chorea have occurred after wasting fevers, such as I have sometimes seen it accompanied by eczema. In a letter which I have before me from Mr. Hammond, of Whetstone, who had great reputation thirty or forty years since for the cure of chorea by arsenic, he is very explicit on this point. “The health has need to be well supported. A full diet of meat and two glasses of port wine should be given daily; the latter with water, if the subject be feeble or excitable. An egg should be taken for breakfast, and all trash in diet avoided; that is, all that adds to the labour of digestion without contributing to support. The only purgative ever employed should be rhubarb or the compound decoction of aloes; but only to regulate the bowels, never to purge. The health should be sustained by air and exercise, and diet only modified by the absence or presence of plethora. With menstrual irregularity, riding on horseback will be useful, and air as much as possible, but not to the point of fatigue.” Again, he says:—“The mineral solution of arsenic is the strongest tonic known; it often subdues ague when quinine has failed. My reputation in the cure of chorea rests wholly on the use of this preparation. I give it in that dose (nine drops three times a day), beginning with four, and gradually, in ten days, getting to nine. I have never known the remedy to fail; at least be assured that few cases of chorea will resist this treatment. If it disagree or headache be felt, lower the dose one drop.”

These are the *ipsissima verba magistri* never published before. They have lain by neglected for many years, and their resuscitation at the present moment appears to me opportune. The preparation is that adopted into the London Pharmacopœia as the liquor arsenici chloridi. In the British Pharmacopœia, there is a modification of its strength. It is no other than De Valangin’s mineral solvent. The directions given are for the treatment of young people; but the difference of the Pharmacopœia must be allowed for.

I consider the comments of Dr. Eustace Smith and Dr. Spender, in recent numbers of the Journal, to be valuable accessions to science, and I should not fear to adopt that treatment, using the precaution to see my patient every day. But I deem it safer to begin with the smaller dose and rapidly to increase it, so as to be on my guard against idiosyncrasy. There is much in the behaviour of arsenic that leads me to think that its operation as a therapeutic agent is directly or essentially on the nervous system. I have found it more than usually efficacious in cases of skin-disease which are complicated with nervous phenomena. For instance, I have recently had a case of extremely localised erythema, affecting part of the hand on its dorsal surface, and always recurring on the same spot. Whenever the patient has come under my treatment, the skin-affection has been controlled by arsenic in quite a remarkable manner. She is, besides, very much the subject of epilepsy. In scarce any other case of eczema have I met with such immediate success, and the patient is correspondingly grateful to one she calls her thirteenth doctor.—*British Medical Journal*, June 5, 1875, p. 747.

16.—ON THE RATIONAL TREATMENT OF SOME FORMS OF HEMIPLEGIA.

By Dr. ALFRED CARPENTER, Croydon.

[Cases of hemiplegia are occasionally but perhaps rarely met with in which recovery takes place, in a manner to contradict the unfavourable prognosis which all ordinary experience warrants. Dr. Carpenter has notes of ten such cases, and the following paper, which was read before the Medical Society of London, is founded upon them.]

Dr. Wilks remarks, in one of his telling lectures upon apoplexy, that of the disease which is sometimes called serous apoplexy he knows nothing; and in another lecture he says "he is occasionally called to a patient insensible or suffering from apoplexy, and on examining the brain he found no evidence of hemorrhage, yet he had no doubt that death did proceed from the brain, the post-mortem appearance being the same as in patients who had really died with clots in the cerebrum."

Now, it appears to me that these are the cases which practitioners like myself meet with more often than those whose work is mainly limited to consulting practice. Dr. Hughlings Jackson says of (so-called) serous apoplexy that it is a term used to designate those cases of speedy death with coma when no blood can be discovered effused in the brain; and he declines to adopt the term, inferring that it is an incorrect one.

Trousseau, on the other hand, thinks that the phenomena which are ascribed to congestion, and which lead to death without producing clot, are due to what he calls cerebral surprise.

It appears to me that some of these cases, not being immediately fatal, are just the cases with which I hope to interest the Society; and without intending to suggest that the term serous apoplexy is a correct one, I may fairly assume that cases do occur, in which no cerebral rupture is discovered after death, and no absolute reason appears to be present why the patient should have died. There is interference with circulation through brain substance sufficient to produce coma and paralysis: sometimes such cases do not die, the patient gradually recovers from his coma: hemiplegia remains for a time, but it ultimately yields to rational treatment. The rules of prognosis which are laid down in some of our guide-books are not always safe rules to follow, for they ignore this class of cases, and lead us to give a much more serious aspect to every case of the kind than it may possibly require.

Thus, correspondingly, I used to be taught that double pneumonia was almost necessarily a fatal disease, and so it appeared to be in hospital practice; but, in point of fact, among well-to-do people, among those who have more blood to spare than they want, it is found, when detected early, and treated by absolute rest and a few simple rules, to be as easily cured as a simple catarrh; and if I am not altogether wrong, the same simplicity is only required in the treatment of some of the dangerous forms of paralysis which are often preceded by complete coma.

Before considering what the principles of treatment should be, I will detail a typical case. A man aged fifty-six has for some time a continuous state of malaise and discomfort, with an increasing feeling of weakness and an inaptitude for either mental or muscular work. For this he takes more stimulant than usual to keep him up to the mark. "Pick me up" is a favourite expression when taking his dram. The patient is off his appetite; he eats but little, and that little must be rich and uncommon: he requires to have his appetite tempted. Then he has a sudden attack of giddiness, becomes faint, either falls or quietly lapses into a state of unconsciousness for a time; sometimes he is convulsed. On recovery from his comatose or semi-comatose state, it is found that one side is weak; it then becomes gradually paralysed, speech is affected, the mouth is distorted, and there is more or less perfect hemiplegia, both sensation and motion being altogether lost, or motion alone being interfered with. After a time sensation returns; speech comes back; but the angles of the mouth sometimes remain

slightly drawn down, but not always to the side affected. In two cases I have met with recurring convulsion without loss of consciousness, but with perfect hemiplegia, which has continued at intervals for a considerable time, and yet there has been ultimate recovery. If the patient is to recover from the shock or surprise, the hemiplegic symptoms gradually decrease and at length altogether disappear; the unfavourable signs pass away in a year or two, and if a proper course is followed they need not recur. In all the cases I have met with there has been a general swelling of the paralysed limbs. This œdema has come on within two or three weeks after the first attack, the skin then becomes tender, and in one or two cases there appeared to be a tendency to that muscular rigidity which is said to indicate that the cerebral lesion has reached the stage which has been described as red softening—a condition such as generally follows upon the formation of a clot of blood effused in the substance of the brain from absolute rupture of cerebral vessels; the effused blood lacerating the nerve-tissue in its vicinity, and inflammatory action following as a natural sequence. When called to a case of the kind in question, the first great object of the attendant should be to prevent the rupture of the cerebral vessels, which may or may not have occurred. I believe that this prevention is more frequently possible among the well-to-do and wealthy classes than is usually supposed. The entire removal of the threatening symptoms which I have detailed, without leaving any evidence of organic damage behind, certainly proves that such symptoms may exist without being necessarily dependent upon absolute rupture. That death takes place in similar cases without rupture is known to most of us and proved by the quotations from the writings of the eminent authors I have named. I think in many cases the absolute break-down takes place after the symptoms have developed, and that cerebral hemorrhage or sanguineous apoplexy is not an antecedent so often as is supposed, but is the consequent of continued impediment to circulation after the coma has appeared.

In such cases, whenever doubtful as to whether hemorrhage has taken place, our exertions should be directed to the arrest of the congestive stage which supervenes upon that which causes the first symptoms. These in all cases depend in the first instance upon an anæmic condition of some portion of the cerebral organs, and which anæmia preceded the active development of the attack. This condition of anæmia probably precedes the acute attack in all these cases. In the majority of those which I have met with in which absolute recovery has taken place, I have come to the conclusion that they were due to a condition of blood allied to that which attends the gouty

diathesis: that there is a condition of the system which may be fairly styled as that of suppressed gout, and that if the cerebral organs could be examined without injury to life, a condition of capillaries would be found somewhat similar to that which exists in those swellings which suddenly arise in the areolar tissue of persons subject to atonic gout; these swellings, tender at first, then become œdematous, afterwards gradually melt away. A somewhat similar condition is seen in an ordinary chilblain, which, however, goes away without leaving so much œdema as attends upon the gouty thrombosis. These swellings are assumed to be caused by capillary plugging; whether rightly so or not I am not able to state, not having an opportunity of inspecting any case *post mortem*, and not being able to find any description of them in any pathological work to which I have access.

It is generally the custom as soon as the patient begins to recover to talk about his debility. If he does not impress this view of the case upon his medical attendant, his friends do. Then comes the great error of treatment. The necessity of keeping him up is insisted on: so many glasses of wine, so much animal food, so much tonic, until at length the gouty condition, or at least the condition allied to that form of disease, reasserts its sway, and the patient goes down again. It is argued that the force of the circulation must be kept up to the mark, that the heart is weak, and strength must be got up by piling more work on to an already weakened organ. In this plan of treatment I am sure we are wrong. Common sense appears to tell us that the circulation having to pass through damaged tubes must not be pressed, that it is important not to put extra pressure upon an already damaged hydraulic machine, and that if we increase action in the circulation by pressing more matter into it, we shall only be adding fuel to fire. Our efforts should rather be directed first to the removal from the blood of those elements of debased and used-up organic matter which represent used-up tissue, and which from some cause or other have not yet been carted out of the system through the proper excretory organs. These we should get removed as quickly as possible. At the same time we should take off pressure from the vessels themselves, and so lessen the chance of rupture in the now bloated tissue of the brain.

In most of the cases which I have met with the patient had been living before the attack at high pressure, both of mind and body, in some of the cases also trying to enjoy the pleasures of life at the same time, or, as it is called sometimes, "burning the candle at both ends." There is a commencing decay of cerebral tissue, inasmuch as the lining membrane of some of the capillaries of the brain is becoming the seat of the morbid

changes, probably of fatty degeneration or so-called atheromatous deposit, not, however, sufficient to allow of rupture unless pressure is put upon it, and not yet fairly discernible to the naked eye.

If we ask ourselves what it is that nature does require to alter the cause, we get a clue to rational treatment. There is in such cases hyperæmia of the body generally, whilst a portion of the brain tissue is anæmic. We do not want more red blood, and there is excess of fatty matter already in the fluids of the body. Our patient can afford to live upon his own excess of heat-producing material for a time, whilst measures are taken for the more perfect purification of his blood. If in the case in question there is no evidence of damaged kidney, if the first manifestation of the tendency to capillary disease has been cerebral, if absolute rupture of the central capillary or other portion of the brain circulation has not taken place, there may be great hopes of perfect recovery, if at the same time the ordinary temperature keeps near to a natural standard, and especially if muscular rigidity does not come on. I have met with two cases of recovery in which there has been a general state of anæmia instead of the usual hyperæmic condition of system which is usually present. In these I gave ammonia with assafoetida as the most useful stimulant, in the form of spir. ammon. foetid. of the London Pharmacopœia; but in the hyperæmic cases I reduced the administration of stimulant to the smallest possible quantity.

Whilst carefully providing that the patient should breathe air as pure as possible, and admitted into the room directly from without, I have taken care that the room is warmed and that the body of the patient is kept warm, so that no loss of power should arise from the abstraction of heat from the general system; and that the quantity of food which might be wanted to keep up the animal temperature should be as small as possible, and thus the stomach should have as much rest as can be given to it. The great reason for this care is the fact that the patient cannot take exercise, cannot do any muscular work; the oxidation of fat and other hydrocarbons which exist in excess in all those who are the subjects of this disease cannot be properly consumed. This defect has helped to produce the condition under which the patient is suffering, whilst from the same cause there is very little opportunity of getting rid of the carbonic acid which is the result of these internal fires upon which animal heat mainly depends. There is a tendency therefore for the fire to be extinguished by its own débris. Whilst taking care therefore that the oxygen provided for the use of the patient is not

depreciated, external warmth to the body generally will assist in limiting the necessity for fresh fuel in the shape of highly nitrogenised food and fatty matter. If the *débris* which is the result of a production of animal heat is not removed, fatty degeneration or some other defective state of tissue is sure to arise both in muscle and nerve. As soon as the tenderness in the skin which generally supervenes after recovery from the shock has departed, I have had the muscles of the extremities exercised by the aid of an attendant quietly and gently kneading the various sets of muscles in the hands for at least two hours every day; the muscles upon the fore-arm or the calf of the leg being grasped firmly by the hand and much of the blood squeezed out of them. Then the limb is flexed or extended so that each set of muscles are taken in rotation as long as the patient can bear it. I thus get regular exercise of the muscles, and by emptying out the blood from them the absorbents and the veins are pressed into action to remove such *débris* as would, if it remained there, produce evil: which would have remained in the system if the muscles were left in that state of repose which this class of patients are supposed to be obliged to endure. This kind of exercise produces an increase in the given number of inspirations per minute, so that it is fair to assume that there is an increased formation of carbonic acid in the periphery of the system, and that this *débris* finds its way out through the pulmonary organs more perfectly than it otherwise would do if the muscles were not exercised.

At the same time I have encouraged the excretory organs by providing an excess of diluting liquid, making the patient take as much water as can conveniently be done, giving it in a medicated state, with phosphate of soda, Pullna water, or small doses of sulphate of magnesia acidulated with an excess of acid, as an aperient, every morning, according to the indications suggested by a frequent examination of the urine; also occasionally using a few doses of digitalis wherever there has been a full pulse with increased frequency of beat.

Lastly, as regards food. If there is one thing which experience establishes more than another in the dietetics of cerebral disease, it is that patients having a cerebral lesion can get on a very long time without azotised or carbonaceous food, provided a sufficient quantity of water and pure air is given,—that nature, under the circumstances which attend upon coma or cerebral congestion of any kind renders the requirements of food of the most limited character. In the cases I am considering, it will be found most beneficial to limit the supply of all the highly-nitrogenised articles of food; to forbid the use of beef, pork, veal, altogether; to allow

but little fat, and not much sugar; forbidding all rich made dishes and heavy pastry; limiting the meal to two courses only, and giving claret or some other light wine freely diluted with water in preference to a vintage which has had an incomplete fermentation and also contains a large percentage of superadded spirit. In all the successful cases I have met with, the daily diet has been fish at least once, sometimes three times daily, occasionally a little mutton, chicken, or game, with simple milk or farinaceous pudding. If the skin has had a tendency to dryness, I have given weak tea with plenty of milk; if there is a fairly acting skin, coffee has been allowed. If the skin has been dry, and the heart sensitive, I have found that tea does not digest well, and in such cases cocoa nibs will suit better. In the earlier stages of the disease the food has been such as a child a year old might take. As the patient progresses, his appetite returns and becomes at times almost ravenous; notwithstanding that, I have only allowed such food as could not produce evil from its indigestible qualities. Mutton broth, milk, rice-pudding, and the various farinaceous dishes which a good cook can always alter, will be found most certain to lead to a good recovery, and if the patient is hungry he can eat these; but if the appetite of the patient is to be considered, if the causes are again allowed to come into operation which produced the gouty state in the first instance, it is scarcely likely that future attacks will be warded off.—*Practitioner*, May 1875, p. 321.

17.—DETAILS OF ELECTRICAL EXAMINATION AND TREATMENT IN A CASE OF PERIPHERAL PARALYSIS OF THE FACIAL AND OCULO-MOTOR NERVES.

By Dr. THOMAS BUZZARD, Physician to the National Hospital for the Paralysed and Epileptic.

How far the application of electricity is available in paralysis of the external muscles of the eyeball is a point upon which some doubt is still entertained. In the case which is here related, an unusual method of applying voltaism to these muscles was employed with success. Incidentally various points of great interest in reference to diagnosis as well as treatment arose in the course of the patient's illness, and the value of electrical tests was shown no less strikingly than the useful effects of voltaism in bringing back paralysed muscles to the influence of the will.

I was called in December, 1872, into the country by Dr. Playne, of Maidenhead, to see a gentleman sixty-two years of age, under the following circumstances:—The patient looked somewhat older than his age, and had been more or less ailing

for some years. A year previously he had suffered from some obscure mental symptoms, which had followed prolonged sleeplessness. He was usually dyspeptic, and had experienced pains of rheumatic character. On December 13th he found in the morning that on cleaning his teeth the water ran out of the right side of his mouth, and his face was observed to be drawn over to the left. Next day he could not close his right eye. When I saw him on December 17th, there was pronounced paralysis of the right portio dura. There was complete inability to close the right eye; the angle of the mouth dropped on the right side; in smiling the face was drawn over to the left; and when asked to show his teeth, the lips were scarcely separated on the right side, whilst on the left the teeth were exposed in the usual manner. The aperture of the mouth, under these circumstances, formed an irregular triangle with its base disposed vertically on the left side. The right eye was painful, and watering from exposure. If there was any impairment of sensibility to touch over the right side of the face it was very slight indeed. When the conjunctiva of the right eye was touched with the finger-point, avoiding the margin of the lid, although the pressure was perfectly well felt, there was no reflex closure of the lids.

Here, then, were the ordinary symptoms of a peripheral paralysis of the portio dura, and the fact that the patient had been out in his garden on the evening before his attack rather later than usual, and that the weather was cold and damp, combined towards the probability of his suffering from a rheumatic affection of the nerve, or at least from a condition referable to the influence of cold.

I had the opportunity of applying electrical tests. I found that neither faradism nor the interrupted voltaic current would excite the right facial nerve. As regards the facial muscles of the right side there was no reaction to the strongest faradaic current which could be borne, but when I applied to them the rheophores connected with a Stöhrer's constant battery, using four cells only, and slowly intermitting the current, I obtained marked contraction of those situated about the angle of the mouth. A similar power applied in like manner to the muscles of the sound side of the face produced no reaction. The sensibility of the skin of the face was decidedly lowered on the right side, especially below the eye, both to touch and to the pain of faradism. The latter fact was peculiarly well marked. The grasp of both hands was weak, but not definitely unequal, and the patient could raise either leg against pressure equally well. There was no marked impairment of sensibility in his hands, but on inquiry he said that there was slight numbness of the finger-points on both sides.

There was no diminution in the power of tasting on the right side of the tongue. There was not then, and there had never been, any weakness in the external rectus muscle of the right eye. I examined the urine, which was pale, clear, acid, and of specific gravity 1013. It contained no trace of sugar nor of albumen. There was general derangement of the digestive functions, with a furred tongue and some diarrhoea. The patient was ordered a quarter of a grain of nitrate of silver, with one-fifth of a grain of opium, twice a day, and an effervescing mixture of citrate of potash and soda, with grain doses of iodide of potassium.

As regards the diagnosis, I thought there were sufficient grounds for believing that the lesion lay in some part of the course of the portio dura. Had it been at the deep origin of the nerve, it was unlikely that the sixth nerve, which (according to Lockhart Clarke) arises from the same nucleus as the facial in the floor of the fourth ventricle, would have remained unaffected. Moreover, and this was the most important feature, the electric reaction was distinctly that indicating peripheral paralysis. When the facial nerve is paralysed from central disease, it is, according to my experience, always the case that the facial muscles retain, either entirely or in great part, their power of being excited by faradism. On the other hand, the absence of excitability by faradism and the exaggerated influence of interrupted voltaism were completely characteristic of facial paralysis *à frigore*. I advised, and it was agreed, that treatment by interrupted voltaism should be employed.

On the 7th March, then, nearly three months after the seizure, this treatment was commenced, and afterwards continued almost daily for three weeks. Stöhrer's constant current battery was employed, at first four cells being engaged, then six, and finally eight. One rheophore was placed on the cheek at the point where the facial nerve breaks into its two great divisions, and the other at various parts of the face; but especially often near the ala of the nostril. The current thus employed caused vigorous contractions of many muscles affecting the nostril and mouth. At other times one rheophore was applied near the outer canthus, and then the current caused contractions of the orbicularis palpebrarum muscle. Each sitting occupied about twenty minutes. One rheophore was lifted and reapplied at tolerably regular intervals of about 30 or 40 in the minute. During the first week the change effected by this treatment, although at once apparent, was not very marked; but afterwards improvement was noticed daily. On March 28th, when the patient returned into the country, the cheek no longer bagged; the lower lip kept closed, instead of falling and showing, as it had done, the lining membrane, over which saliva

trickled; the eye could be very nearly closed. Nor was this improvement altogether the result of a secondary contraction equivalent to that so often seen in the paralysed muscles in a case of hemiplegia, for a very considerable power of moving the mouth by voluntary effort returned. The nerve-twigs to the occipito-frontalis muscle must, I think, have escaped injury. At all events, when I tested the frontal part of this muscle a few days after beginning the treatment described, I found that it responded readily to the faradaic current when one rheophore was placed over the emergence of the portio dura and the other on the muscle. It was also capable of being contracted by voluntary effort.

Nearly two years had elapsed when I was again, on May 28th, 1875, summoned to see this patient. I found him in his bedroom, sitting up, with his back to the light, which his left eye was quite unable to tolerate. So much photophobia was there that I had to refrain from turning his face to the window whilst I examined him. The left eye was closed by ptosis of the upper lid, but the patient could, by a strong voluntary effort, open it, though the lid immediately afterwards fell. There was intense pain, referred to the ball of the eye, and also pain, together with tenderness on pressure, upon the left parietal bone, near its junction with the frontal. He had double vision, the images being crossed—that to his right belonging to his left eye. In order to avoid the confusion and giddiness caused by this diplopia, he was wearing a shade over the left eye. I found that there was partial paralysis of the branches of the left oculo-motor nerve, going to the levator palpebræ superioris, the internal, superior, and inferior rectus muscles. It seemed that the patient had been exposed to a great deal of domestic trouble and anxiety, with the result that his appetite and digestion had failed, and a few days before I saw him he had complained of double vision. It appeared also that several decayed teeth, which had been troubling him for some time, had interfered with his power of taking sufficient nourishment. I advised some chloride of ammonium, which seemed to have a good result as far as the pain in the eyeball was concerned. A fortnight later, however, I found that whilst he had ceased to feel pain in the globe of the eye, the paralysis of the muscles before referred to as partial had become complete. There was complete ptosis, and absolute inability to turn the left eye either upwards, downwards, or towards the nose. The symptoms indicating an affection of the left third nerve, which might be accompanied or caused by some effusion in its sheath, I advised a trial of iodide of potassium, although very doubtful whether it would be tolerated. In effect, the first dose so upset the patient's stomach

that he could not be induced to try another, and Dr. Playne then prescribed some quinine, ammonia, and gentian. This answered very well; the appetite and general health improved, and when the patient came to town on July 7th, I found him looking much better than he had been. There was still, however, ptosis of the left eyelid. He could, when requested, lift the lid to a certain extent by a manifest effort, but it was immediately dropped. The vision of this eye not being absolutely occluded by the state of the lid, he was forced to cover it with a shade, as otherwise he was so embarrassed by diplopia that he could not walk without staggering. I found the recti muscles greatly wanting in power, but not, I think, quite so incapable as when I had last seen him. However the eye was turned outwards constantly, and although by a strong voluntary effort, it could be carried a very little way towards the nose, and a still less distance upwards and downwards, it was practically fixed in a condition of external strabismus, and was useless for optical purposes.

Guided by my experience of the result of interrupted voltaism in the facial paralysis of the opposite side of his face more than two years previously, I thought it likely, now that acute symptoms had subsided, that a similar mode of treatment might lead to good results in restoring the action of the muscles of the eyeball which were paralysed. Instructed, too, by former experience, I felt that faradaism was not the treatment proper for the condition. The muscles of the right side of the face had quite failed to respond to faradaism, but they were excited by a very mild voltaic current when it was slowly interrupted. So it seemed likely that a mild and interrupted voltaic current was indicated in the present condition. The best mode of applying this was not so evident. When metal rheophores covered with wetted kid were applied to the closed lids, and a current of varying strength employed, either the electric influence was unfelt or it was painful to the skin. There was difficulty, too, both with these rheophores and also with sponges in applying the stimulus exactly where I wished it. I now bethought me of using the finger as a rheophore, and tried it in the following manner. An assistant having applied to the patient's left temple a sponge rheophore connected with one (it was not material which) pole of a Stöhrer's constant current battery, I grasped in my left hand another sponge rheophore coming from the other pole, and then applied the forefinger of my right hand, covered with a single thickness of muslin wetted with pure water, to the right upper eyelid of the patient. The battery was Weiss's (Foveaux's), which had considerably run down, so that it was perhaps only half-strength. Cautiously increasing the number of cells (it was long before any

electric sensation was felt), I found that the current from between 30 and 40 cells could be employed in this manner, my body, through which it was bound to pass offering a great resistance, and serving indeed as a rheostat. The application was made through the closed lids. The finger proved an exceedingly convenient rheophore. I could apply exactly the amount of pressure desirable, and could reach portions of the globe which it would have been exceedingly difficult to act upon in any other manner. Moreover the strength of the current could be gauged at every instant. That which was employed was just sufficient to cause me to feel a distinct shock in the knuckle of my right forefinger every time the current was interrupted. Occasional flashes of light were observed by the patient, but he felt no pain. We thought we could see a little improvement in power after the first day's application, but there was no doubt of this at all at the close of the second sitting. Not to weary with a daily record, I may say that this treatment was applied on fifteen occasions in all, the applications extending over a period of three weeks. The time occupied at each sitting was from twenty to thirty minutes. A daily increase in power of the muscles was noted; and when the patient returned home, after the last application, he was absolutely well. The lid was entirely under control, and the movements of the left eye were in every respect perfect. Of course, therefore, there was no longer any double vision, and the use of the shade was discarded. The patient has since remained quite well.

Remarks.—I need scarcely say that it is a matter of the gravest import, as regards the prognosis, whether a paralysis of the facial muscles is diagnosed as peripheral or as depending on a lesion of the central nervous system. The importance of this is increased when the patient, as in this case, is a man who has passed the middle period of life; and becomes intensified when, as occurred in the instance which I have described, paralysis of one side of the face is followed by loss of power in certain muscles of the eye on the opposite side. The general conditions, the patient's age, his weak state of health, his family history,—all combined to give a very serious aspect to his case, which even his complete recovery would not of itself suffice to counterbalance. For it is quite conceivable that a man of this age, and with such a history, might suffer from a central nervous lesion, possibly involving small hemorrhages, which could be repaired, and the paralytic symptoms be *ipso facto* removed, and yet that he might be left in a state peculiarly prone to the repetition of attacks which might at any moment involve districts where the occurrence of lesion would have a serious influence upon life. The mere fact, therefore, of this

patient's complete recovery does not of itself bear conclusive testimony to the peripheral character of the affections from which he suffered. The electric reaction however, of the facial muscles paralysed in the first attack, lends complementary evidence of a kind sufficient, I believe, to enable us to say that not only was that attack certainly dependent upon a lesion of some part of the facial nerve, not of the nervous centre, but that in all probability the second attack was of similar character. Experience, which by this time has been sufficiently universal to make its results positive, teaches us that when there is paralysis of facial muscles, and these a few hours after the attack show a diminution, rapidly going on to an entire abolition of contractility on exposure to induced currents, whilst contractility is effected with abnormal facility by the interrupted voltaic current, the lesion is not a central one, but involves some portion of the portio dura nerve. I have seen no exception to this rule. The lesion may result from cold, from wound of the nerve, or from compression, but it is always a lesion of the nerve, and not of the nervous centre. It was with great confidence, therefore, that when the test applications of the induced and voltaic currents in this case were followed by the results described, I pronounced the facial paralysis to be of peripheral origin. When in process of time, the second attack occurred, involving on this occasion the oculo-motor nerve of the opposite side, although in the nature of things the application of electrical testing was not practicable, it was not unreasonable to infer that this also depended upon a similar cause to that which had caused facial paralysis two years previously, especially as isolated paralysis of one oculo-motor nerve is almost always peripheral. I ought especially to say that there was good reason to exclude the probability of syphilis in this case, and that there has not been any sign of gout. My prognosis was accordingly favourable, as regards the question of the site of the lesion, although I could not properly give any decided opinion upon the question whether the paralysis would be recovered from or remain permanent. I inclined, however, to the more favourable view, and thought that electrical treatment would be likely to assist recovery.

The voltaic instead of the faradaic current was chosen then, because the paralysis of the eye muscles, like that of the facial muscles, was deemed to be of peripheral character. It seems likely, especially from the researches of Schiff, that induced currents do not determine directly the contraction of muscles, but only act through the medium of the intra-muscular nerves. When these are damaged, as by the influence of cold, the power of causing contraction of the muscles by faradaism ceases. Not so, however, as regards the interrupted voltaic current, the

influence of which is now much more marked than it is in healthy striated muscle. Dr. Onimus, of Paris, in some interesting papers which have lately appeared, expresses the opinion that in cases of paralysis of the facial nerve the muscles, although they do not atrophy, pass into a condition in which the contractile substance resembles rather smooth muscular fibre or protoplasm than normal striated muscle. He reminds us that continuous currents have a much more marked action upon smooth fibres than induced currents, and to provoke the contraction of the unstriated fibres a current of much less intensity is required than for striated muscles. And as with normal smooth fibres so also with those striated fibres which, from an injury to the intra-muscular nerves, have acquired much of the character of smooth muscular fibre. In this mode Dr. Onimus explains the remarkable difference between the action of the induced current and that of voltaism in cases of facial paralysis, as well as the curious fact that the voltaic current acts much more energetically in such cases than in the healthy condition. In the case above related it seems probable that the branches of the portio dura distributed to the muscles, and not to the trunk of the nerve itself, were affected. For the occipito-frontalis muscle escaped, and this omission, which is easily explained if the lesion be supposed to be located in a number of nervous twigs, some of which elude the hurtful influence, presents considerable difficulty if we imagine an injury to the trunk itself. Moreover, the sense of taste was preserved on the affected side, which suggests that the lesion was at least beyond the point where the chorda tympani is given off. The impairment of the cutaneous sensibility, which was certainly more marked than I am in the habit of finding it in such cases (there is often a little numbness), is probably to be explained by a localised influence upon the branches of the sensory nerve (fifth) similar to that exerted upon those of the portio dura. The exact effect upon the muscles, which was brought about rapidly by the influence of voltaism I do not find it easy to explain. It would seem—and this point is extremely interesting—that if we cut off the influence of the will from striated muscular fibre the structure tends to degrade, and, as regards its function, passes into a state closely resembling that which is characteristic of involuntary muscular fibre. The resemblance is threefold: the fibre is no longer contracted by the influence of the will, it is acted upon by voltaism when faradaism fails to affect it, and the action of voltaism upon it is much more marked than upon healthy striated muscle. Apparently the effect of applying voltaic currents to muscular fibre so degraded is to lead it back to its normal condition. It often happens, as it did in this case, that the will acquires its power to cause con-

traction of the recovering muscles before they will respond to the influence of the induced current, but after they have ceased to be abnormally excited by voltaism. When this occurs it is probably only a question of time as to when faradaism will be able to exert its ordinary stimulating power once more. When I last tested this gentleman's facial muscles, a few weeks ago, I found that voluntary power over them was restored perhaps to three-quarters of the normal extent, that interrupted voltaism affected the injured in no higher degree than the uninjured side, and that the influence of the induced current had again become manifest, though not quite perfectly. I suppose that voltaism replaced the action of the will, as far as concerned the preservation of the muscular fibres, till such time as the intramuscular nerves had recovered and allowed the passage of the volitional influence. The circumstance that the face has not entirely recovered is, doubtless, owing to the injury to some of the muscular nerves having been irreparable. There is nothing, it seems to me, in such examples as this, which requires one to fall back upon an electrolytic action of voltaism upon the constituents of the nerve-trunk to account for phenomena which are to be explained more easily in the manner described. I think that the very rapid clearing up of the oculo-motor palsy (in the second attack) under the influence of voltaism goes far to prove that the lesion in this, as in the other paralytic seizure, was of a superficial character. The injury at the time electrical treatment was commenced was probably to a great extent repaired, but the muscles which had been cut off for a long time from the stimulating influence of the will had degraded into a state approaching that of involuntary muscular fibre, and were incapable therefore of being acted upon by volition to any effective purpose. The few applications of voltaism restored the muscular fibres to their natural condition, and they became both physically and metaphysically "voluntary."

The use of the hand as a rheophore is not new. It has been employed by many for the application of faradaism, especially to the spinal column. But, as far as I am aware, the use of the finger in the manner described for applying interrupted voltaism to the eye muscles is novel. It is certainly very convenient. What we want in such a case is a large quantity of electricity of low tension, and this is, I think, especially well arrived at by interposing the operator's body in the course of the current, and employing a considerable number of cells.—*Lancet*, Oct. 2, 1875, p. 484.

18.—DRUNK OR DYING? THE CHIEF CAUSES OF COMA, AND THE DIAGNOSTIC MARKS OF EACH VARIETY.

By Dr. GEORGE JOHNSON, F.R.S., Professor of Medicine in King's College, Physician to King's College Hospital.

The attention of the profession and of the public has lately been directed in an especial manner to the means of distinguishing drunkenness from apoplexy and other forms of sudden coma. When I am addressing my pupils on the subject of apoplexy, I am in the habit of referring to the difficult question of diagnosis in the terms of the following extract from one of my lectures:—

Diagnosis.—You are called to a patient in a state of insensibility; you know nothing of his previous history, except that he has been found unconscious in the street, and you are required to ascertain the cause of his alarming condition. You must first consider what are the *possible* causes of the symptoms. He may have a clot of blood in his brain, the result of disease or a blow on the head; he may be in that comatose condition which not unfrequently follows an epileptic fit; he may be poisoned by opium or by an excess of alcohol; or he may be suffering from the effects of uræmia.

Now, you will be less likely to make an erroneous diagnosis if you continually bear in mind that in some of these cases an accurate diagnosis is not only extremely difficult, but absolutely impossible until the progress of the symptoms has been watched for a certain time. That the case is one of cerebral hemorrhage would be rendered probable by such symptoms as extreme relaxation or convulsive twitchings of the limbs on one side, lateral deviation of the features, or inequality of the pupils; but with hemorrhage on the *surface* of the brain none of these paralytic symptoms may be present. Marks of external injury, especially about the scalp, should be carefully looked for in every case. A black eye or a cut or bruised scalp may have resulted from a drunken man falling down, but the fall may have fractured his skull or ruptured a blood-vessel in the brain.

That the coma is a sequel of an epileptic fit might be suspected if it were found that the tongue is bitten and bleeding, and if there are hemorrhagic spots beneath the conjunctivæ or the skin; though these signs are frequently absent in epileptic cases. Epileptic coma is usually of short duration, and the speedy return of consciousness removes any doubt that may have existed as to the nature of these cases.

In cases of poisoning by opium, one of the most striking and constant symptoms is extreme contraction of the pupils. The skin, too, is usually bathed in a profuse perspiration. With

respect to the contraction of the pupils, it has been observed that in cases of apoplexy with hemorrhage into the pons Varolii the pupils have been as much contracted as in opium-poisoning.

When the patient's breath is tainted by the odour of some alcoholic liquor, we of course suspect that he is drunk. It must not, however, be forgotten that as a drunken man is especially liable to be seized with apoplexy, and to suffer from accidental mechanical injury in the streets of a crowded city, so we may have to deal with the complication of alcoholic intoxication and cerebral hemorrhage on a fractured skull. It is a common practice to give brandy or some form of alcoholic stimulant to anyone who has become faint or giddy, and so it may happen that an unconscious patient's breath is tainted with the odour of drink administered after the onset of an apoplectic seizure.

In cases of uræmic coma the urine is usually albuminous, and presents other physical and chemical signs of renal disease. Uræmic coma, in a large proportion of cases, is preceded by convulsions. The tongue is commonly brown and dry in these cases, and the breath has a most peculiar and characteristic fœtor. Yet, even with all this evidence of renal disease, the case may not be one simply of uræmic coma; there may, in addition, be the complication of cerebral hemorrhage, which, as we know, is a frequent result of chronic Bright's disease.

The difficulty of diagnosis between renal disease and drunkenness is sometimes increased by the fact that the urine may be rendered temporarily albuminous by alcoholic intoxication. A remarkable case of transient alcoholic albuminuria occurred when my friend and colleague Dr. Baxter was House-Physician to the Hospital. A man between twenty and thirty years of age was brought in one night by the police. He was unconscious, and breathing stertorously. He appeared to be drunk, and a large quantity of vinous liquid was pumped out of his stomach. The unconsciousness continued, and it was then suspected that he might be suffering from uræmic poisoning. This suspicion was confirmed by the fact that his urine, drawn off by a catheter, was "loaded with albumen." He was then put into bed, cupped over the loins, and a purgative was given. When Dr. Baxter visited the ward the following morning, he found the man up and dressed, and clamouring for his discharge. He said that he had been very drunk overnight, but now he had nothing the matter with him; and he passed some urine which was found to be in every respect quite normal. The temporary albuminuria was the result of renal congestion, caused by the excretion of an excess of alcohol through the kidneys.

In all doubtful cases of this kind it is better to err, if you err at all, on the side of caution and safety. Obviously it is better to allow a drunken man to recover his senses in the ward of a hospital than to send an apoplectic patient to die in the cell of a police-station. When a mistake is made on the opposite side, and a supposed drunkard dies apoplectic, it is a very natural, though it may be a very erroneous inference, that some one is to blame and deserving of punishment.—*Medical Times and Gazette*, June 12, 1875, p. 630.

DISEASES OF THE ORGANS OF CIRCULATION.

19.—ON THE CURE OF LEUKHÆMIA SPLENICA BY MEANS OF PHOSPHORUS.

By Dr. WILSON FOX, F.R.S., Holme Professor of Clinical Medicine, Univ. Coll., Lond.

[Dr. Broadbent has already drawn attention to the utility of phosphorus in the treatment of leukhæmia splenica, and the experience of Dr. Wilson Fox corroborates his observations. The patient, E. C. U., was by trade a baker, and thirty-seven years of age.]

On admission he was intensely pallid, with extremely marked anæmia of the mucous surfaces and of the nails; markedly emaciated; no eruption of skin; very feeble, hardly able to stand without assistance; no œdema. He had frequent slight rigors; was pyrexial, and sweated profusely. The urine was highly-coloured, sp. gr. varied from 1010 to 1025; it deposited lithates, but contained neither albumen nor sugar. The lungs were healthy. The heart's apex (displaced by the abdominal tumour) was in the fourth interspace; there was a faint basic systolic murmur with its maximum at the second left cartilage; venous hum was heard in the neck, and arterial murmurs were present.

His appetite was bad, his bowels were costive, though previously diarrhœa had alternated with the constipation; the stools presented no special abnormal appearance. He suffered much from flatulence. He had constant thirst; mouth dry, tongue broad, flabby, and covered with a thin white fur. The sight was unimpaired. He occasionally suffered from severe headache. Anæsthesia existed over the outer part of the left thigh. Some hyperæsthesia was also observed in the course of the last dorsal nerve.

The abdomen was distended chiefly in the left flank in the splenic region, where there was felt a hard resistant mass pushing outwards the cartilages of the tenth and eleventh ribs,

and reaching backwards nearly to the spine, though the intestinal note could be elicited posteriorly between its posterior border and the spine. It was smooth, without any nodulation; movable from behind forwards, and movable on deep respiration. The anterior border was distinct, slightly rounded, and in its middle the splenic notch could be distinguished on deep pressure. The whole mass was absolutely dull on percussion, and without fluctuation. The dulness superiorly extended to the sixth rib in the axilla, between the eighth and ninth ribs in the back. By palpation and percussion the tumour was traced extending across the abdomen to within $1\frac{1}{2}$ in. to 2 in. to the left of the umbilicus; thence it extended transversely backwards until it touched Poupart's ligament, about 1 in. anterior to the crest of the ilium, below which bone it passed posteriorly. The tumour was intensely painful on deep pressure. Between it and the diaphragm friction could be heard. The patient was unable to lie on his right side owing to the aggravation which this caused of the pain felt in the thigh and knee, and to pain in the left scapular region.

No enlarged veins were seen on the surface of the abdomen. There was no ascites. The liver was not enlarged. There was no enlargement of any of the superficial lymphatics, nor could any be felt in the abdomen, with the exception of a few slightly in excess of the normal size in the inguinal regions.

The blood drawn by pricking the finger looked much paler than natural. The corpuscles were nearly twenty times their usual number, from thirty to forty-five being seen in the field. This proportion remained constant during the greater part if not the whole of the period before he began to take the phosphorus. The white corpuscles were of two kinds, large and small, the former about twice the natural size; some were binucleated; most were granular. There was, in addition, a large number of molecules, which were aggregated into irregular masses. There was no alteration in the shape or appearance of the red corpuscles.

Until Jan. 20th, when the treatment by phosphorus was commenced, his state varied but little. He had more or less continuous severe pain in the tumour, which at times was aggravated by sharp paroxysmal attacks, relieved occasionally by blisterings and endermic application of morphia, or by the hypodermic injection of morphia.

Until this date no material improvement had taken place in the general condition of the patient. He was still febrile, though slightly less so than on admission; his blood was in about the same state, and the attacks of pain in the region of the splenic tumour were severe. Having just met with Dr. Broadbent's paper, I determined to try the effect of phosphorus, and ordered

one-fiftieth of a grain three times a day, which on Feb. 23rd was increased to one-thirtieth of a grain three times a day. All other treatment beyond rest and nourishing food was discontinued. No ill effects were observed from the phosphorus throughout. At first but little appreciable influence was noticed on his general condition, except that the pulse had diminished in frequency, varying up to Feb. 8th from 88 to 96, after which it gradually fell, rarely ever reaching 90, and varying from 76 to 62. The pyrexia also, as before stated, subsided, and after Feb. 8th it only reached 99° on two occasions (Feb. 25th and March 5th). Subnormal temperatures, occurring almost exclusively in the morning, but not falling below 97°, were occasional throughout the months of February and March, but almost ceased, though not entirely, during the month of April. On the 25th March he contracted a bronchial catarrh without any pyrexia, which only lasted a few days, and was not treated except by a few doses of chloral hydrate at night, to allay cough.

By the 8th Feb. there was a marked improvement in the appetite, which continued, and the bowels became regular.

By the early part of March the aspect of the patient had begun to improve, and on March 2nd examination of the blood with the microscope showed only about eight white corpuscles in the field of a quarter of an inch, still being divisible into those of large and small-sized, besides a number of molecules.

By March 14th he could walk with help.

By April 6th he was much better; the anæmic look had disappeared, and there was some diminution in the size of the spleen, which no longer passed below the crest of the ilium, while the dulness superiorly reached to the eighth interspace in the axilla.

April 9th. Five to nine white corpuscles were seen in the field of the microscope.

20th. They had diminished to five or seven.

May 5th. There was no apparent excess whatever of the white corpuscles. The patient was able to walk a mile without fatigue. The anterior border of the spleen, instead of reaching nearly to the umbilicus, was five inches to the left of the middle line, and about two fingers' breadth from the crest of the ilium, while the dulness superiorly only reached the seventh rib in the axilla. It was no longer painful.

On the 7th he was discharged for Eastbourne, discontinuing medicine; and in June he returned, looking the picture of health, but without any further appreciable diminution of the size of the spleen. His blood, tested against that of a healthy man, showed no increase of the white corpuscles, but these were nearly double the natural size.

I subjoin his weighings during the latter part of his treatment by phosphorus. I very much regret that these were not ascertained during the first part of his stay in the hospital:—Weight two years ago in perfect health, 159 and 174 lb.; March 12th, 124 lb.; 22nd, 127 lb.; 30th, 130 lb.; April 6th, 132 lb.; 16th, 133½ lb.; 23rd, 135 lb.; 29th, 140 lb.; May 6th, 142 lb.; middle of June, having returned from Eastbourne, 147 lb.

Remarks.—It hardly appears necessary to comment on the diagnosis of this case as being one of genuine leukhæmia. The change in the blood was certainly not so far advanced as is sometimes observed, when the white corpuscles may be to the red as 2: 3. This condition is, however, only noticed as a rule in the final stages of the disease, and even in these the proportion of white to red may by no means be excessive, and, as I have myself observed, they may even diminish from the amount seen in the earlier periods. It appears, also, from Mosler's observations, that splenic enlargement may exist during a considerable period before any marked increase of the white corpuscles is perceptible, during which time other characteristic symptoms of the disease may nevertheless be present, and also that as many as sixteen corpuscles counted in the field may, together with splenic enlargement and slight pyrexia, be sufficient to characterise the disease. Dr. Broadbent doubted whether the case observed by him was an absolutely characteristic one of leukhæmia, on account of the want of correspondence between the degree of anæmia observed and the number of white corpuscles found. I am disposed, however, to believe from observations on other cases, that this want of correspondence is not unfrequent in true leukhæmia, and that the red corpuscles suffer in their nutrition in this disease as well as in the anæmia splenica or lymphatica of Hodgkin, from which a moderate excess of white corpuscles in the blood is sufficient to distinguish it. In this case, however, the increase in their number was sufficiently great fully to characterise the disease. The absence of the severer hemorrhagic symptoms was certainly a point in the patient's favour; but in other respects, as regards his emaciation and great loss of strength, his prospects were most unfavourable; and before the good effects of the phosphorus were observed I only anticipated for him the melancholy and painful termination which is almost constantly, if not invariably, observed in this disease. I say almost constantly because Mosler anticipates for quinine, if used in the earlier stages, a somewhat hopeful influence on the cure of leukhæmia, and has quoted four cases of cure by this agent; I must, however, confess that even in very large doses, of ten to twenty grains daily, continued during a long period, quinine

has always failed in my hands to exercise the slightest influence, either on the fatal progress of the disease or on the pyrexia. Iron also has appeared to me to be equally inefficacious, and the experience of the majority of observers seems to have been as unfavourable as my own.

It may be noticed that neither in Dr. Broadbent's case nor in mine did the spleen return to its natural size, though in mine there has been a not inconsiderable diminution of its dimensions. Dr. Broadbent is indeed under some fears, owing to not hearing again from his patient, that some unfavourable change may have taken place in his state. It is impossible as yet to speculate what effect the still enlarged spleen may have on the general health, but the hope that this may be slight or *nil* does not appear to me to be ill-founded. In the cases of cure reported by Mosler under the influence of quinine, the spleen is stated to have returned to its normal dimensions; but one of these by Dr. Hewson, of Pennsylvania, was distinctly a case of malarial origin, in which paroxysms of intermittent fever still persisted, and in which the administration of the quinine appeared to exert a beneficial effect, while in the others the splenic enlargement was less than in the present instance.

As far as is yet known, no case of spontaneous cure of leukhæmia has been reported, or of recovery under indifferent treatment. The fact that some amelioration had from time to time taken place in this patient's state during the earlier period of his illness affords no ground for the belief that this explanation is valid for the rapid improvement observed after he had commenced to take the phosphorus. Such alternations of improvement and exacerbation are common during the early periods; but when once the splenic tumour has attained a considerable size and the increase of the white corpuscles in the blood is marked, any change for the better, except slight and transient modifications of the pyrexia, are rarely observed.

I believe, therefore, that in this case, as well as in Dr. Broadbent's, the cure is exclusively attributable to the use of the phosphorus, and he is warmly to be congratulated on the successful verification of an induction, and on the discovery of a cure for at least some cases of a disease so painful, distressing, and hopeless as this almost invariably proves to be. It may be found to be more beneficial in the earlier rather than in the later stages of the disease. What its influence may be when the vast excess of white corpuscles sometimes observed has been attained, can only be verified by further observation, but I trust that it will soon receive a more extended trial in all phases of the disorder, and that it may be shown that one more disease has been thus rescued from the category of the almost hopelessly irremediable.—*Lancet*, July 10, 1875, p. 45.

DISEASES OF THE ORGANS OF RESPIRATION,

20.—IS CONSUMPTION A FORM OF SEPTICEMIA?

By Dr. WILLIAM MARCET, F.R.S.

The maintenance of life and health is a perpetual conflict between the phenomena of nutrition and those of physical decomposition or fermentation and putrefaction. The more vigorous the state of health, the more thoroughly are these physical changes kept at bay; but in proportion as health gives way, so do these physical phenomena, creeping on slowly and insidiously, obtain a hold upon the living body very difficult to shake off. We all know that tissues are ever changing, a constant substitution of fresh molecules to old effete molecules being in progress. This change is a particularly active process, with respect to muscular tissue, for example, requiring, as I have shown ("An Experimental Enquiry into the Nutrition of Animal Tissues"), not only that blood should supply the substances necessary to the new molecules of muscle, but moreover, that it should yield a comparatively large proportion of potash, the only object of which is to combine with the phosphoric acid of the assimilated or organised molecule, so as to make it into a crystalloid phosphate, which substance moves out of muscle back again into the circulation by a mere physical process of diffusion. A movement of a somewhat similar kind takes place, when surface water, with certain substances it holds in solution (others being left in the soil), finds its way out of a field through the drain-pipes. Every fresh molecule of muscle requires a supply of phosphoric acid and albumen with small proportions of potash and magnesia, and these substances have apparently to undergo in the blood a preliminary change, establishing new attractions between each other, in order to become converted into bioplasm or nutritive material. This material is finally organized by undergoing a transformation of a purely morphological nature. Some similar phenomenon must also take place in blood with respect to the nutrition of blood corpuscles; thus there is no part of the living body that is not in a constant state of molecular change, except hard effete matter, such as the nails, which are out of reach of the circulation.

If it is borne in mind that the body consists of a mass of molecules always moving, and that the amount of heat required for this molecular change implies the development of a considerable force of energy, it will be readily understood that no physical decomposition or putrefaction of these molecules of matter in physiological motion can possibly take

place. I might explain my meaning by referring to a stream of water, which will not freeze even in very cold weather, because the molecules of the water are always in motion, and cannot be acted upon by another force possessed of a tendency to change the molecular form of the fluid; but as soon as it becomes still, then the opposition to the new arrangement of molecules under the influence of cold no longer exists, and ice is formed.

Now, in the same way as in running water fresh molecular attractions or arrangements cannot take place, because of these molecules being in constant motion; so it is that in the living body, where the various molecules of tissue are ever moving, the arrangement of these molecules, necessary for the operation of decomposition or putrefaction to set in, cannot take place. The comparison of nutrition to a stream is defective, however, in this respect, that running water is made up of molecules in movement, and undergoing but a relative change of position; while in the process of nutrition of tissue there is not only a movement of molecules, but also a destruction of old molecules and formation of new ones. These several changes take place through the agency of some power which is not physical—at all events not so in the usual acceptation of the word; but whatever be the nature of the present force, it is this united molecular movement and change which, I verily believe, acts as the cause so thoroughly preventing physical decomposition or putrefaction from taking place during life and in health.

If, however, that wonderful mobility with which living molecules of tissue are endowed should become weakened, and blood lose its power of preparing phosphoric acid, potash, and albumen for the manufacture of flesh; if the morphological change of nutritive material into organised tissue should be lessened in its activity or arrested, and blood yield an insufficient quantity of potash to combine with the whole of the phosphoric acid of an organised molecule; again, if the constituents of mature tissue should no longer become transformed into substances diffusible, allowing of their rapid passage into the circulation,—then physical decomposition will set in, as ice will form in a stream of water on its course becoming slackened or arrested.

The circumstance that urine is, as a rule, constantly being secreted in the human body, both during and after digestion, and at night as well as in the daytime, appears to me to show that the phenomenon of the nutrition of tissues continues uninterruptedly. Dr. J. L. Prevost, of Geneva, after producing an artificial hernia of the bladder on a rabbit, and incising this organ in a longitudinal direction, observed the urine to run out as a rule alternately from each ureter, with an

interval of several seconds between each ejaculation. These emissions coincided with the termination of the vermicular contraction of the ureter, clearly seen to extend to the bladder. In the rabbit, under normal conditions, from seven to eight emissions take place per minute. This phenomenon continues, I understand, uninterruptedly all day long.

Pursuing this same train of thought, and now taking into consideration the changes occurring in the body in disease, it will be readily observed that they frequently bear the character of a simple physical decomposition.

In some cases as in fevers, ammonia, one of the common products of decomposition of animal matter, is formed in comparatively large amount, while it is only met with in very minute quantity as a normal constituent of the living body; expired air containing traces of this substance, and there being often, perhaps constantly, crystals of ammonico-magnesian phosphate in the faecal matters.

In severe cases of typhus fever the exhalations from the skin and the discharges from the bowels contain ammonia. Reuling (Murchison, *Treatise on Continued Fevers*, p. 144) found that the air expired in certain diseases, such as typhus, uremia, and pyemia, contained an excess of ammonia. These results were subsequently confirmed by the independent researches of Richardson. Dr. Murchison adds that in severe cases of typhus the breath has undoubtedly often an ammoniacal odour; he observes in enteric fever that the stools are very often ammoniacal.

Another circumstance which confirms the view that ammonia in fevers is due to decomposition, is the rapidity with which putrefaction takes place after death in this class of diseases. "In most cases (in typhus) there is a tendency to rapid putrefaction after death, more rapid than after death from other diseases at the same time of the year" (Murchison).

In diabetes the excessive excretion of sugar may be readily accounted for by the occurrence of some circumstance which arrests the peculiarly vital transformation of the amyloid substance, or glucogen, of the liver. This remarkable substance, discovered by Cl. Bernard, undergoes transformation into sugar immediately after death, a phenomenon which may be considered as one of the very earliest post-mortem changes.

In albuminuria (Dickinson, *Pathology and Treatment of Albuminuria*, p. 234), it is known that the ammonia is increased in quantity. This may be owing to a decomposition of urea present in excess in the blood; at all events, it originates from some physical change taking place in the living body, and opposed to vital power.

In consumption, at first sight no physical metamorphosis appears to take place in the body before death; but such is not

the case. The expectoration may, towards the termination of the disease, emit an obvious faint smell of incipient putrefaction; moreover a change invariably takes place in the chemical composition of the tissues in phthisis, which possesses a purely physical character. First, in muscular tissue the chlorine and soda, as I have shown experimentally, are greatly increased beyond their normal proportions in health. My inquiries yielded 0.167 parts of chlorine (mean of 11 determinations), and 0.237 parts of soda (mean of 6 determinations), for 200 parts of muscular tissue in health. The power which, under normal circumstances, prevents the diffusion of chloride of sodium from blood into muscles apparently no longer acts, or is much weakened, in phthisis some time before the fatal termination, allowing of the chloride of sodium contained in the blood while circulating through flesh, to diffuse itself into that tissue; hence it is that we find it charged with common salt after death from that disease, one pound of muscle then containing a mean of 21.28 grains of common salt, instead of 9.6 grains.

There is another change I have constantly met with in muscular tissue in phthisis, which looks like a commencement of physical decomposition; I am now alluding to the moist and soft state of these muscles observed in a post-mortem examination; while in all other cases, I believe, the muscles look dry and firm, if examined shortly after death.

This change in consumption appears to me to be owing to an alteration, of a physical nature, in the state of the water in the tissue. A modification of the same kind takes place after a time in the flesh of animals slaughtered for food, and in perfect health; thus meat, after hanging up in a larder for a few days, will exhibit this soft and damp appearance; and ham, even cooked, will often just before it is unfit for food, become quite damp and even wet, a well-known unmistakable sign of incipient decomposition. This change appears to me to begin some time before death in phthisis, a soft, flabby, and often puffy consistence of the muscles of the lower extremities being frequently observed during life; and the examination of muscles, a few hours only after death from phthisis, certainly conveys the idea that the alteration took place before life was extinct. It is true that the proportion of water is slightly greater in muscular tissue in consumption than it is in health, amounting to a mean of 5827 grains for one pound of flesh, instead of 5390 grains; and it is just possible that the dampness is due to that excess of water, although the change appears to me much more likely to result from a difference in the actual physical condition of the water.

I might extend the present remarks, but those I have

thought of offering show that, as the vital force becomes diminished, and the power of nutrition of tissues lessened, the tendency to some physical change peculiar to organic matter deprived of life gradually obtains the upper hand, and should this change pursue its course it must eventually destroy life. Let us now consider the case of a punctured dissecting wound. Animal matter undergoing decomposition is introduced into a healthy tissue by accidental inoculation: if the subject of the accident is strong and in good health, the probability is that no mischief, or a mere local inflammation, will follow. How many students prick themselves while dissecting and how very few suffer in consequence of this inoculation! Others, however, who may be in ill-health at the time or exhausted from overwork, will not escape; perhaps on the second day after the accident the first symptoms of septicemia will set in, followed two or three days later by a fatal termination. These are the facts; they are easily explained. Where the molecular movement of nutrition is strong and active, the poison has not time to act, the molecules of tissue changing too rapidly to allow of an abnormal kind of molecular metamorphosis to set in; a local inflammation may result from the inoculation, leading perhaps to the formation of a deep sinus; but if any further absorption of matter undergoing decomposition takes place at the seat of the inflammation, it can do no farther mischief, because of the molecular changes in healthy living tissues defying decomposition and putrefaction. On the other hand, where the molecular movement of living tissues is slow and in want of energy, as it would be in ill-health or a state of fatigue from mental overwork, then the inoculated matter will have time to act upon the molecules of tissue before they undergo their normal change, and generate decomposition in the whole mass, causing a rapid cessation of the phenomena of life. In the operation-ward of an hospital a patient, after undergoing an amputation, is often at the time in a low state of health; at all events, he will be inevitably very much weakened by the operation, and the power his tissues possess of wasting away and forming afresh is considerably reduced. In consequence of this state of his body a tendency to physical change must set in.

After reading Mr. Erichsen's suggestive essay on Hospitalism, the mind dwells involuntarily on hospital septicemia, and the means of arresting such an obvious cause of mortality—a subject the author of the essay has admirably treated. But other considerations also arise out of the present publication, and amongst these the question as to whether septicemia is not a cause of death under other circumstances than operations, and if a putrescent matter cannot originate in the body

weakened by disease, instead of being introduced at a cut surface of an amputated limb.

But before entering upon this subject, let us ascertain exactly what is septicemia. Erichsen observes (*Hospitalism*, p. 72): "By septicemia I mean a blood-disease, a form of typhus or putrid fever, directly occasioned by the absorption into the system of putrescent matter from foetid ulcers, necrosing cancers, &c., which may then become self-infecting. In it there are no rigors or sweats, but extreme depression of vital power, and usually rapid death with typhoid symptoms. After death no metastatic abscesses are found. . . . It is a disease that may affect the uninjured as well as the wounded; and the reason why a person who has been the subject of a severe operation or of a serious injury is more liable to septicemia than another appears simply to be, that his constitution has been weakened by the shock to the nervous system or by the loss of blood sustained, and that consequently he is rendered less resistant to the invasion of any disease of a miasmatic type." And in another place of the same essay the author remarks (p. 75): "The cause of septicemia appears to me somewhat obscure. It does not appear to be distinctly connected with overcrowding, but rather with the development of putrescent discharges from unhealthy or malignant ulcers. The offensive discharge from ulcerated cancer uteri is supposed by some to tend very specially to its production, and it has been a cause of death in ovariectomy, when practised in the same building in which a woman suffering from this disease was lying."

We have now arrived at the main point of my communication; and I must beg to draw the attention to the state of the body in consumption. Before phthisis, or rather its acute or active stage, sets in, it is now generally acknowledged that there must be either a tubercular or pneumonic deposit in one or both lungs. In some cases softening of this abnormal material, with febrile symptoms follow rapidly on the inflammatory state leading to the original deposit; in others a considerable period extends between the occurrence of the primary change and the outbreak of the acute stage; it may even happen that the new growth remains for many years without giving rise to any active mischief. I have met with many illustrations of these different classes of cases. It is very obvious that, so long as people with deposits in their lungs continue healthy, the present abnormal material undergoes nutrition, otherwise it must be subjected to physical change; but this new formation, which appears to be possessed of no particular function, and must be much less abundantly supplied with vessels than healthy tissue, cannot have so active a nutrition as that of the pulmonary tissue in the sound state; and it may

be safely inferred that trifling circumstances, which would exert little or no influence on the normal process of nutrition, might seriously interfere with that of such growths. Among these circumstances must be mentioned, in the first place, the presence of decomposing organic matter in the air breathed, which, acting on the abnormal material as it would upon non-living organic matter, arrests the nutrition of that material, and generates septicemia. If the septic particles floating in the atmosphere are harmless in perfect health, it is because the molecular changes connected with the healthy nutrition of pulmonary tissues are sufficiently active to resist this power of decomposition.

The abnormal growth in the lungs, being no longer properly nourished, breaks down, the state of mal-nutrition extending to the capillary vessels, which become ruptured, and blood is brought up from the bronchial tubes. The sequel of this state of poisoning is often rapid or galloping consumption; and it must be acknowledged that a case of this kind exhibits features so closely allied with those of septicemia, that it is impossible to overlook their near relationship. The high temperature of the body, rapidly increasing emaciation, deficient appetite, and state of prostration establish a marked connection between these two diseases. Finally, unless certain means be adopted which I shall presently refer to, death is nearly certain to close the scene, just as it does in hospital septicemia, although less rapidly. In cases where the septic action of decomposing pneumonic deposits is less virulent, we have a condition frequently met with in consumption, slower in its progress. The main symptoms of this chronic state are a constantly high temperature, with quick pulse and steadily-progressing debility and emaciation; while the physical signs are those of consolidation and breaking down of tissue.

The object of the treatment must be to arrest the septic power of the poison which forms within the lungs, together with the physical changes resulting from its action. Medicines, I regret to say, act as a rule but unsatisfactorily towards that object; at all events, those generally in use in such cases, as quinine or digitalis. What antiseptic medicines will do towards that object remains to be seen; carbolic acid certainly appears useful, but we do not know enough of its physiological action, and cannot tell yet to what extent it may be given safely; perhaps the apparently favourable action of arsenic in some cases of phthisis is due to its antiseptic properties. Preventive measures to the introduction of septic material into the lungs, such as charcoal or cotton respirators, may also be of service. I have obtained very satisfactory results from the use of charcoal respirators, especially among hospital

out-patients, who often live in an impure and tainted atmosphere.

There is a means, however, which certainly acts very positively towards obtaining the desired effect; this is removal to a high locality, somewhere on the hills, at a station between 300 feet and 500 feet higher than that where the patient may be residing. I am alluding, of course, to those who may be living within a short elevation above the sea-level; but even should acute symptoms set in at a certain height, say 1000 feet above the sea, it is remarkable how beneficial may prove the mere fact of removing three or four hundred feet higher up.

These remarks apply not only to consumption, but as a rule to all cases with quick pulse, high temperature, debility, and a deficient state of nutrition. I might bring forward a number of instances bearing out this fact, and have already done so on other occasions. The Mediterranean coast is admirably suited to such a means of treatment, as in many places a row of hills rises within a short distance from the sea-side, where patients will find comfortable accommodation at various altitudes above the sea-level. The little town of Cannes, which has an English colony increasing in number every winter, is especially favoured in this respect, villas and hotels having been built on the hills within easy reach of the town.

I make it a rule to be constantly on the watch for a rise of temperature and acceleration of the pulse in my consumptive patients, and if these symptoms with other signs of acute disease show themselves, it is my practice to urge upon them the importance of moving up at once to the hills. I have found such means successful in arresting most intractable hæmoptysis, bring severe pneumonia to a successful issue, cut short in a very few days a state of long-continued fever, and in many instances stay the progress of phthisis.—*St. George's Hospital Reports*, vol. vii., p. 200.

21.—A RECOVERY BY ARTIFICIAL RESPIRATION, AFTER TRACHEOTOMY, IN A CASE OF DIPHTHERITIC CROUP.

By Dr. BENJAMIN W. RICHARDSON, F.R.S.

[Dr. Richardson two years ago had a case in which artificial respiration, carried out with the double-acting bellows, led to the restoration of natural breathing five successive times. Very disappointing, however, to relate, the patient afterwards died from extension of the pulmonary lesion. The present case ended completely successful.]

On March 1 of this year I was summoned late at night by my friend Dr. Wilbe, of Finchley-road, to see a little boy five years of age who was suffering from croup, or diphtheritic croup, and who was breathing with so much difficulty, that death from suffocation appeared to Dr. Wilbe to be imminent if tracheotomy were not at once performed. I went provided with everything for the operation. I found the child breathing with the utmost difficulty, owing to the obstruction in the larynx. He was restless, and at times slightly convulsed; his lips were blue, and his body was becoming cold. The breathing was so noisily shrill, from the narrowing of the larynx, that we had some difficulty in making a correct diagnosis of the condition of the heart, but in a brief interval of quiet I detected that both sounds of the heart were clear, and that there was no obvious indication of obstruction to the course of blood through the right side of the heart, from separation of fibrine.

Agreeing entirely as to the necessity for the operation, I performed it at once, Dr. Wilbe administering bichloride of methylene. The methylene produced rapid and gentle general anæsthesia. I opened the trachea as low down as I could conveniently, experiencing no difficulty except from a little excess of bleeding from the divided surface of an unusually large thyroid gland. So soon as the opening was made into the trachea, there was sharp expulsion of air from the lungs, together with extrusion of a portion of false membrane. This over, I introduced the outer blades of Fuller's tracheotomy-tube, and through them the inner tube. The child was now allowed to recover from the anæsthesia, the tube being neatly and firmly tied in position. Free breathing through the tube was soon established, and the return to consciousness, from the anæsthesia, was attended by favourable symptoms. The heaving of the chest ceased, the face lost its lividity, and the surface of the body became warm.

The operation was performed at 10.30 p.m. on a table to which the patient had been removed. He was taken back to bed at 11.5, and fell into a sleep. To watch him during the night, and to prevent suffocation from obstruction of the tube, we obtained the assistance of Mr. F. Otley Lovell, who, in the previous case of a similar kind, to which reference has been made, rendered most prompt and valuable assistance. On this occasion Mr. Lovell was joined by his brother, Mr. W. F. Lovell, who took turn with him in the careful watching that had to be carried out. To prevent, as far as was possible, the danger of death from asphyxia, every available means was provided for clearing the tracheal tube, and for changing it if that were required. I also fitted up the double-acting

bellows as on the former occasion, arming the free end of the tube from the bellows with a portion of firm elastic tubing that would pass readily into the tracheal tube should the necessity for artificial respiration become imperative.

On meeting Dr. Wilbe and Mr. Lovell in consultation at 10.30 on the following morning, March 2, the report was that the child had slept during the night with only two interruptions. He had fed himself with two teacupfuls of milk. He was breathing comfortably through the tube, his body was of natural warmth, and the asphyxia had entirely disappeared. He passed through this day favourably.

Early next morning—namely, at one o'clock of March 3—the breathing became embarrassed, owing to plugging-up of the tube, and as the tube could not be cleared in position, Mr. Lovell was obliged to remove the inner tube. It was nearly choked with a compact mass of secretion, which adhered with great firmness. The patient now breathed easily through the outer blades of the tube, and they therefore were left simply in place. In a few hours the breathing again became embarrassed; at 3 p.m. the tracheal opening was plugged, and the patient was asphyxiated. The blades were promptly removed, and a portion of membrane was expelled. He now for a short interval breathed through the wound, and then ceased to breathe altogether, and to common observation appeared to be dead. At this juncture, Dr. Wilbe and Mr. Lovell, who happily were present, passed the elastic tube of the double-acting bellows into the wound, and set up artificial respiration. The artificial respiration brought back animation in a few minutes, and natural inspiration followed; but the artificial process had to be repeated, at times, during a quarter of an hour before independent breathing was fully re-established.

After the natural respiration was completely restored, the outer blades and inner-tube were re-introduced into the trachea. The breathing continued easy during the rest of the day.

On Thursday, March 4, at 3 a.m., the breathing having once more become laborious, the tracheal tube was cleared with a feather, after which, for several hours, the breathing remained free. In the afternoon, the blocking-up again occurred, and at 4.30 p.m., at a consultation at which we were all present, it was agreed to remove the metal tube, and to introduce a larger-sized vulcanite tube. As the new tube was being inserted, some false membrane was coughed through it. The patient continued to breathe easily through the vulcanite tube until 11 p.m., when some temporary obstruction occurred, and the respiration was for a little time laboured. In the course of this day the child ate a little beef finely

minced, and some small pieces of orange; at intervals he took a teacupful of milk.

On the morning of Friday, March 5, the breathing again was very difficult. The tube was removed by Mr. Lovell at 4.15, and a still larger vulcanite tube inserted. Relief followed, with sleep for four hours. At mid-day the child showed signs of great exhaustion, was exceedingly restless, persisted in picking the skin beneath the wound, and refused food. There was redness of skin—in fact, a faint erysipelatous blush—round the wound, and an increasing difficulty of breathing. There was also an extreme fetor from the mouth, and a large portion of diphtheritic membrane was discovered on the left side of the fauces. The tube being obstructed, was removed, and a new one was put in its place. At four in the afternoon, when we again met in consultation, we deemed it expedient to remove the vulcanite tube in order to introduce one of larger size. The change brought more decided relief, and a large portion of false membrane was coughed up through the tube. The skin around the wound, over which there was the blush of inflammation, was painted with styptic colloid. In the evening the child took food, and falling asleep soon afterwards, slept until after midnight.

At 1.40 on the morning of Saturday, March 6, the breathing was arrested by an obstruction within the tube. Dr. Wilbe, who on this occasion kept watch, removed the tube and replaced it with a clean one, and with the usual relief. After this, the child coughed up much mucus from the lungs, took food, and at 3.45 fell asleep. Later in the day, Mr. Lovell had occasion to remove and clean the vulcanite tube twice, owing to the urgent difficulty of the breathing; but the secretion with which the tube was clogged was much less firm and tenacious. The inflammatory redness around the wound was less, food was taken with relish, and the little patient was able to play with his toys. At 10.15 the breathing was again attended with so much difficulty, that the tube, which was clogged, had to be removed and replaced. After this, a fair night was passed. In the course of Sunday, March 7, the tube was removed, cleared, and replaced twice; a good night followed.

On Monday, March 8, the tube was removed, and was replaced by a clean one at 8.15 a.m. In the afternoon of the same day, after visiting the patient with Dr. Wilbe, we found the breathing sufficiently free when the vulcanite tube was out of the trachea to warrant the suggestion that the wound should be left simply open. The patient was now fairly convalescent.

From this time recovery took place rapidly. There was a slight paralysis of the glottis, and for a day or two, when the patient swallowed milk, a little of it flowed into the trachea,

and escaped by the wound. But this difficulty soon passed away. The external opening healed up soundly, and in a few weeks I had the pleasure of making a friendly call, with Dr. Wilbe, to find the boy restored to perfect health.

It is difficult, in recording the facts of a case such as the above, to avoid the expression of an enthusiasm which, however natural, were best concealed. But the facts, accepted with all the reserve which ever belongs to the true historian of scientific results, possess a practical value which may, and indeed ought, to be earnestly enforced. They add, in the first place, an importance to the operation of tracheotomy, which Antyllus little dreamed of when first he ventured to suggest it, and to describe with so much simple accuracy the mode in which it was to be performed. They add a new importance to the experiment of Robert Hooke, on which he founded the process of artificial respiration. They show the modern physician that by his surgical skill he may even restore life, when life itself, to the common observer, is beyond recall. The practitioner, armed now with the means of restoring the respiration through the opening he has made into an obstructed windpipe, will feel that so long as ever there is evidence of life, though it be even such evidence as can only be detected by the stethoscopic examination of the heart, there is a chance before him of resuscitating by the plan of combining the operation of tracheotomy with artificial respiration. It is clear that in many such cases he will succeed, and, with a few exceptions, he is bound to make the attempt at success.—*Medical Times and Gazette*, July 17, 1875, p. 64.

22.—COPAIVA IN CROUP.

In the "Transactions of the Medical Society of the District of Columbia," vol. i., No. 1, after relating a case, Dr. Lincoln wished to draw attention to a very important remedy in the treatment of croup—copaiva—which he considered of the greatest use in this and similar cases. He thought it prevented the re-formation of false membrane. On the night referred to in the report, when he removed the second specimen, he found the child as bad as ever, labouring under dyspnoea from false membrane in the air-tube. He removed the inner canula, but found no membrane in it: sent for copaiva, and in the meantime applied a mixture of copaiva and glycerine (of which a small quantity was in the house) to the inner canula, which he then reinserted. This produced a paroxysm of cough, and a piece of membrane was thrown out. He afterwards gave one drachm of copaiva, with prompt relief: since then had applied a mixture of copaiva to the inner canula with great benefit,

according to the statements of the parents. There were still some patches of membrane about the palate. Has seen the efficacy of copaiva in many cases; in one, a case of very severe membranous croup, a full dose of one drachm would again and again relieve the urgency of the symptoms, and the child recovered. He would have performed tracheotomy in the case but for an existing vitiated condition of the system.

As to chloroform, Dr. Lincoln considered that in Dr. Walsh's case no danger need have been apprehended from the anæsthetic, as instruments were at hand ready to open the trachea at any moment. He thought, however, the apparent final success was due to the copaiva.

Dr. Miller has used copaiva extensively in croup for thirty years, and had before spoken of its efficacy. He was in the habit of placing a phial of balsam copaiva in possession of all his patients subject to croup, directing them to take doses of twenty or thirty drops before sending for medical aid. The result was, that whilst he used to be frequently called out at night to attend croup cases, he was now but seldom annoyed at night by similar calls. So great was the faith of his patients in this remedy, that he had often been applied to for his so-called "croup medicine." It was especially valuable in the early stage.

Dr. Lincoln had never seen copaiva fail if given in the first stage of the disease, and had derived great benefit from it in every period of the complaint. In reply to a question by Dr Fenwick, he said the remedy was of great use, even in the pseudo-membranous form of croup.—*Practitioner*, May 1875, p. 365.

23.—ON TAR AND IPECACUANHA SPRAY IN THE TREATMENT OF WINTER COUGH.

By Dr. WILLIAM MURRELL.

The drug used was wood-tar, the *pix liquida* of the Pharmacopœia. This was made into pills, each containing two grains, by mixing it, by means of a gentle heat, with a grain of wax and two grains of powdered liquorice root. Some difficulty was experienced in coating these pills, as the spirit used for this purpose dissolved out the tar. In private practice, we have therefore usually employed small capsules, each containing from two to three grains. Larger capsules, similar to those used for copaiba, are also made, but they contain a larger dose of the drug than it is necessary to administer in cases of bronchial catarrh. There are several other preparations containing this drug which are largely used on the continent, and

might with advantage be introduced into this country. The *dragées de Christiania au goudron de Norvège* are elegant little boubons, each containing five grains of tar. Tar-water, or "eau de goudron" is also made, which contains two grains in the drachm, and may be taken in sugar and water, or with claret at dinner, the combination being almost tasteless.

The observations on the treatment of chronic bronchitis and winter cough by the ipecacuanha spray were originally published in August last. As a considerably increased experience of this method of treatment, both in hospital and in private practice, has not only confirmed our previous statements, but has added several new points of interest to our knowledge of the subject, a brief *résumé* may prove not unacceptable. The inhalations prove most useful in those cases in which the patient suffers from cough and dyspnoea on exertion during the winter, but is comparatively free from these symptoms in summer. The expectoration is usually abundant, and is often frothy and expelled with difficulty. There is never any true hemoptysis, although the expectoration may be occasionally streaked with blood after a violent paroxysm of cough. This condition may be accompanied by considerable loss of flesh, lowness of spirits, and other symptoms, which quite incapacitate the patient from following his occupation during the winter months. In these cases, almost without exception, the patient either comes of an asthmatic or phthisical family, or he follows some employment which necessitates his exposure to cold, or wet, or dust. Many of these patients suffer from gout or chronic rheumatism. On making a physical examination of the chest, only a little emphysema may be detected, or there may be sibilus over both fronts and backs, with bubbling rhonchus at the bases. It is very necessary in these cases to ascertain the absence of organic cardiac mischief. A patient, who last year suffered from bronchial catarrh, and was greatly benefited by the ipecacuanha spray, applied for relief this winter. The old treatment was adopted but with little benefit; and, on a more careful investigation of the case, it appeared that the patient had, during her absence in the summer, suffered from rheumatic fever, and that the dyspnoea was due to mitral regurgitation. The spray has proved most successful in those cases of winter cough in which the dyspnoea is the prominent symptom. In true neurotic asthma, however, little or no benefit is derived from its employment, and it may even increase the frequency and duration of the paroxysmal attacks. The spray has been used with advantage in a few cases of phthisis, both in the early and in the advanced stages, but our experience upon this point has been limited.

The method of giving the inhalation may be now considered.

In our earlier experiments, Richardson's double-balled spray-producer, such as is used for ether, was employed; but during the past winter the number of patients under treatment at the hospital has necessitated the employment of Siegle's steam spray-inhaler. The ipecacuanha wine was used either pure or variously diluted, the most usual strength being one part of the wine to one or two of water. The use of undiluted wine occasionally produces dryness of the throat and nausea, the latter symptom most frequently occurring in those cases in which the patient is not careful to expectorate the mixture of saliva and condensed spray which accumulates in the mouth. The quantity of wine used at each inhalation varied from a half to two drachms; in a few cases as much as an ounce was given, but with no advantage over the smaller quantity. The Richardson's spray-producer atomised one minim at each squeeze of the ball, so that about 150 squeezes were usually given when a mixture of one in two was employed. The Siegle's apparatus, when fully at work, vaporises a drachm in about three minutes. The inhalations were given daily, the patient usually requiring ten or twelve.

The benefit derived from the spray, though often prompt, is in many cases of several months' duration. All the patients under treatment last year who have returned this winter, have stated that they have been freer from cough and dyspnoea than usual during the summer months.

During the past winter, other drugs, including carbonate of ammonia, iodide of potassium, and tartar emetic, have been used in the form of spray in the treatment of these cases, but the results have not been satisfactory.—*British Medical Journal*, May 29, 1875, p. 706.

24.—ON PYTHOGENIC PNEUMONIA.

By Drs. T. W. GRIMSHAW and J. W. MOORE, Dublin.

“*Bad hygiene increases the amount of pneumonia, and so does imprisonment.*” In illustration of this statement reference may be made to the accounts of local epidemics lately recorded by various writers.

In the *Medical Times and Gazette*, April 4, and June 20, 1874, a remarkable outbreak of this form of lung disease, at East Sheen, London, is described under the title of “Sewer-gas Pneumonia.” The *Irish Hospital Gazette*, November 1, 1874, contained the following abstract account of the outbreak in question:—

“*Sewer-gas Pneumonia.*—On Saturday, March 14, the parish sewer in the road exactly opposite a first-class boys' school

at East Sheen, Mortlake, London, S.W., was opened by order of the Rural Sanitary Authority, for the purpose of inserting a ventilator protected by a charcoal screen. Mr. Waterfield, the head-master of the school, remonstrated, and backed up his own scientific objections by a certificate signed by several eminent medical men, including Sir W. Jenner, Bart., two of whose sons were students at the school. Sir W. Jenner especially mentioned the danger of pneumonia in connexion with the probable escape of sewer air in the vicinity of the school. The Sanitary Board persisted in carrying out their intention, with a trifling modification. On Friday, March 20, a high tide in the Thames blocked up the mouth of the sewer, and the compressed gases forced an opening through the ventilator. The rooms of the school facing the road were filled with a foul-smelling sewer air. Next morning a boy sleeping in one of these rooms was taken seriously ill with pneumonia; on the evening of the same day two other boys and two servants became similarly affected. One of the servants ultimately died. Mr. Waterfield at once broke up his school for the time being. In consequence of strong representations, the Sanitary Board removed the ventilator and closed the opening on the evening of the 21st, after which all smell ceased, and no additional cases of illness of any kind occurred in the house. As a rider to this instructive history, we have only to add that for fifteen years no illness attributable to drainage evils had occurred, and that two inspectors, sent down by the Local Government Board, pronounced the sanitary arrangements of the school-house to be excellent."

Dr. L. Dahl describes an outbreak of pneumonia in the Akerhus Prison, Christiania. It commenced on December 18, 1866, and terminated in May, 1867. Among an average of 360 prisoners in that period, 62 cases occurred, of which 15 terminated fatally. The weather was very cold at the height of the epidemic, but the prisoners who worked indoors were about equally attacked with those who worked in the open air. Professor W. Boeck attributed the outbreak chiefly to *overcrowding*; and Dr. Dahl draws attention to the improved state of affairs coincident with a diminution of the number of prisoners from 387, on January 1, 1867, to 278, on December 31, 1867. A former similar outbreak in the prison occurred in 1847, and coincided with a prevalence of *scurvy*.

In a paper, entitled "My Experiences as to the Causes of Inflammation of the Lungs," Thoresen, of Eidsvold (Norway), mentions the occurrence of several cases of croupous pneumonia near some glassworks, at a time when the disease was almost absent from the town. The epidemic was confined to a single row of cottages, and lasted about a month—from July

19 to August 22, 1869, *when diarrhœa and cholérine prevailed, both at the glassworks and in the neighbourhood—that is, during a “gastric epidemic constitution.”*

Dr. Bryson describes a very remarkable epidemic of pleuro-pneumonia, in some ships of the Mediterranean Fleet, in 1860. The disease was of a low, asthenic type, accompanied with great congestion of the lungs, and in many cases, on board the ship chiefly affected—the St. Jean d’Acre—with *scorbutic symptoms*. Cachexia was marked, and *diarrhœal and dysenteric attacks* were common both in the early and in the later stages. The most tangible causes of the malady were *over-crowding* and most defective *ventilation*. There were good grounds for supposing that the affection was communicated by the sick landed from the attacked vessels to other patients in Malta Hospital. Dr. Bryson was able to trace several points of resemblance in the symptoms of this pleuro-pneumony to the lung disease in cattle.

The origin of pneumonia, in the instances just quoted, under conditions usually regarded as exciting causes of typhus (*overcrowding and defective ventilation*), and of enteric fever (*fœcal miasm*), and the apparent *contagiousness* of the disease when it arises under such circumstances, seem to justify us in giving to this type of pulmonary inflammation the distinctive and etiological title—*Pythogenic Pneumonia*.”—*Dublin Journal of Medical Science*, May 1875, p. 404.

DISEASES OF THE ORGANS OF DIGESTION.

25.—THE TREATMENT OF TAPEWORM BY CREASOTE.

By HENRY BRICKWELL, Esq., Somersham, Hunts.

Some fifteen years ago a man, discharged from the army with lung disease and tapeworm came under my notice, when it occurred to me that the destructive properties of creasote to the lower grades of animal life might be made available for killing or so weakening the vitality of intestinal worms that they could easily be got rid of. I therefore gave him some three times a day, shortly after meals, for six days, and on the seventh a dose of castor oil and turpentine, which brought away a worm twelve yards long. I have since tried creasote for destroying round worms with great success. In one case a large mass of more than a hundred worms of all sizes came away, and the patient has not been further troubled by them. I have not succeeded so well with the troublesome thread worms of adults, but have some doubts if the remedy were fairly tried. I have just had the following case of tapeworm:—

W. E., aged twenty-three, labourer, pale, sallow, and sickly-looking, but fairly fleshy, came to me with hæmoptysis and symptoms of tubercle in the lung, which passed off, and he was able to work through the winter. Four months ago he came to me suffering with the prevailing malady, bronchitis, and he then first began passing portions of tapeworm. I deferred treating him for the latter until his health was better. A month ago he returned in fair health, having frequently passed portions of worm since his last visit. I gave him one drop of creasote made into a pill with pulv. tragacanthæ co. three times a day, half an hour after each meal, so as to impregnate the ingesta. As the stomach bore the medicine well for two days I increased the dose to two drops three times a day for two more days, and then to three drops at a time for two more days. On the seventh day I gave him a dose of castor-oil (aperients acted very strongly on this patient, or I should have combined it with sp. terebinthinæ). On the fifth day of the treatment a worm eight yards long came away, and he had slight diarrhœa. Not seeing me, he continued the creasote on the sixth day, and took the oil on the seventh, which acted very freely, but brought no more worm away. There appear to have been no symptoms to indicate the presence of the worm until he began to pass portions of it. He had, however, complained of a feeling of weakness, sinking, and faintness for several years, more particularly in the evening. These feelings have now disappeared, and he is stronger, better, and more healthy-looking than before.

The two points that have struck me are—first, that he began passing the worm during a febrile attack (could that have influenced the vitality of the worm, and so tended to its passage?); and, secondly, that he had a chest complication. It is a curious coincidence that these symptoms should have co-existed in the only two cases of tapeworm that have come under my notice.—*Medical Times and Gazette*, September 18, 1875, p. 328.

26.—PRACTICAL REMARKS ON THE CAUSES AND TREATMENT OF SOME COMMON FORMS OF VOMITING.

By Dr. PAUL HENRY STOKOE., A.B., Peckham Rye, S.E.

The most severe and protracted attacks of vomiting I have witnessed have ensued from over-stimulation during pregnancy; under which circumstances there has existed a condition of the volition so disorganised as to reduce the power of self-restraint to total abeyance; the miserable sufferers finding it impossible, in their intolerable drought, to refrain from incessantly imbibing huge draughts of any handy thirst-quencher, to the serious augmentation of their distress.

In these cases the firm hand and inflexible will of an experienced nurse will alone supply that element of control which is wanting; and if we are sufficiently explicit in limiting the quantity of liquid to be taken and exact as to its quality, we may expect the more urgent symptoms rapidly to subside; we shall then be in a position to administer such medicaments as the irritable condition of the stomach requires, while the uterine derangement will be best met by the contact of pessaries containing belladonna and opium with the mouth of the womb. It may be remarked, by way of caution, that the above-mentioned condition is sometimes associated with albuminous urine, even in the earlier months of pregnancy; and when it is so the young and over-anxious practitioner must not be too prone, in the absence of other reasons demanding his interference, to induce abortion; as he will almost invariably find that the albumen will disappear with the evolution of the foetus long before danger-point is reached.

Less severe but more numerous are the cases of vomiting which result from gastric irritation brought on by alcoholism without other complication; and in them we have almost every conceivable difficulty to contend against. An infatuated patient who deceives both you and herself; a disease constantly recurring from the repeated application of the exciting cause; an obscure train of symptoms, often with the impossibility, or inadvisability at least, of putting leading questions, which are likely to arouse a spirit of opposition; while we ourselves are swayed by conflicting feelings of sympathy and reprobation; so that we cannot too carefully investigate the symptoms (mostly subjective) which characterise alcoholism in its earlier stages. We may at the outset observe that there are two well-defined conditions of alcoholism in which vomiting is a prominent symptom. In one the vomiting is the result of an oft-repeated debauch, of the previous night perhaps, in which case we may trust to the offender's sensations of wretchedness, backed by the more material agency of the vomiting, to work a cure, for the present at least; in the other the vomiting is due to altered gastric secretion and to degenerative changes resulting from chronic inflammation of the coats of the stomach; a condition which is more or less remediable, until, through long continuance, thickening takes place locally, the vital organs become congested, and the digestion and other functions of life are permanently impaired. My experience compels me to affix the stigma of frequency in this latter form of vice on the female sex, men being more prone to the less secretive modes of indulgence. If the patient be a gentlewoman she will never acknowledge her weakness until recurrent attacks render it patent; hence it is of much importance that we do not overlook the

obscure signs which mark the complaint in its infancy. You will find the subject of it a nervous, fluttering, excitable creature; restless and incapable of carrying out any settled plan or occupation, or of taking rational interest in anything. She is no reader, rarely if ever a good domestic manager, as the ill-conditioned appearance of her household testifies; but is rather the victim of the vapours and general malaise: she is greedy of change, must have excitement, may be at the theatre, not seldom at the conventicle; is the subject of neuroses, which may have a gouty or rheumatic source, or originate in nervous degeneration from alcohol. She is hysterical in fact, sometimes from a recent quarrel with her unfortunate help-mate, sometimes from pangs of remorse at her wretched infatuation. We shall find that her tongue is usually coated, especially of a morning, with a thick creamy fur; but sometimes it is preternaturally clean and glistening; it is also tremulous, her feet being equally so; while this unsteadiness is less noticeable at first in the hands. The breath may be sickeningly offensive; nausea or vomiting is seldom absent, and is most common in the earlier hours of the morning. Diarrhoea is also a very frequent concomitant, coming on before she leaves her bed, and going to the extent of five or six loose bilious evacuations in the day. Sleeplessness too is a constant and great aggravation of her sufferings.

She will assign fifty different reasons for her ill-health; all, in the absence of signs of organic lesion, insufficient to account for the frequency of the attacks. You will probably ascertain sooner or later that she does not intrust her health to you alone, but is in the habit of procuring other advice in order that your suspicions should not be excited by a too frequent recourse to your aid. Under these circumstances you will act wisely in putting a direct question to her husband if she have one; and if not (for old maids and young ones too, and widows when disappointed of their proper rôle in life, too often substitute an unnatural for a natural excitement), you must make an opportunity of questioning her friend or servant—and herein is no breach of confidence—and having by this means put your hand on the diseased spot kindly and seriously tell her what is the cause of her ailments and what their only cure. When a lady has once constituted her medical attendant her father-confessor it is marvellous with what assurance she will on each repetition of an outbreak confide to him the cause.

Need anything be said about remedies in such a case? The bane and antidote are both before her. The water she mixes with her brandy (for, sad to say, high-born women are not above this vulgar drink!) will if taken pure and simple soon cast out the evil spirit; but unfortunately it requires a steadier

hand and a stronger will than hers to pour it out and convey it to her lips; and if she will not consent to place herself under some restriction, such as that of a sensible friend or a trained nurse, it will be found that all attempts at amendment, however sincere and well-directed, will be frustrated by a constant turning aside from the use to the abuse of stimulants. The approved remedies, ice, effervescing draughts of soda-water and of citrates of potash and ammonia, bismuth, and prussic acid, will, so long as stimulant is refrained from, afford relief; and sometimes under the attacks of horrible depression, from which the dipsomaniac is wont to suffer, dry champagne or brandy and soda-water will be required, but nothing short of total abstinence will effect a permanent cure. It is so much easier to give utterances to promises of amendment when sick than to carry them out when hale, that we may expect the most solemn assurances to be again and again broken, until the patient declines from the pitiable condition of the occasional toper into the disgusting state of the confirmed drunkard. Meanwhile all the resources of therapeutics will have been exhausted; treatment which has proved beneficial in one attack fails in the next, and we run through over and over again in every possible combination the catalogue of effervescing salines, opiates, belladonna, creasote, bismuth, and so on; we apply cataplasms and wet compresses to the epigastrium, or more powerful still blisters (which not inappropriately carry with them some punishment), and sometimes sprinkle morphia in half-grain doses over the vesicated surface, or use the more trustworthy hypodermic injection of the same. If she be warned in time and amend before it be too late, iron combined with ammonia will serve as a temporary substitute for the alcohol until such time as the nervous forces be restored, and nux vomica will be found to materially assist the flagging energies of the digestive and nervous systems.—*Guy's Hospital Reports*, 1875, p. 486.

DISEASES OF THE URINARY ORGANS.

27.—BENEFICIAL USE OF JABORANDI IN CASES OF DIABETES INSIPIDUS, OR POLYDIPSIA.

By Dr. T. LAYCOCK, Professor of the Practice of Physic and of Clinical Medicine in the University of Edinburgh.

The following case of polydipsia was the subject of a clinical lecture by Dr. Laycock during the last winter session, in which he pointed out that the disease in both forms of diabetes and in certain kinds of Bright's disease and dropsy is a *neurosis*, having its seat in that part of the encephalon which regulates

the amount of water in the blood, and having, therefore, both anatomical and functional relations with the sudoriparous glands and the kidneys, and with the appetite for water and the sense of thirst. The pathology and clinical history of both kinds of diabetes were discussed, and the experiments of Claude Bernard and others, as to the production of polyuria, albuminuria, and glycosuria by injury of certain portions of the floor of the fourth ventricle, were alluded to as having a distinct relation to the study of those diseases clinically.

Case 1.—(Reported by J. M. Brown, M.B., class-assistant to Professor Laycock.)—Wm. K., aged 40, a shoemaker, was admitted to the Edinburgh Royal Infirmary Dec. 24th, 1874. He complained of great thirst, a feeling of pain and heat from the lips to the stomach, profuse urination, and a tendency to pass water frequently; also of dimness of vision.

His previous health had been good until about five months prior to his admission. During these five months he had suffered much from thirst, which was most severe at night and in the morning. He had a hard chancre many years ago, but no other personal indications of syphilis subsequently. His wife had consecutively seven still-born children. As to his social history, he had drunk considerably of whisky, having a bout of drunkenness, lasting for several days, about every three weeks.

Condition on admission.—He is a slightly-built man, 5 ft. 4½ in. in height, and weighing 8 st. 4 lb. The integument is hard and dry; temperature 98°. He stated that he did not think he had perspired for five months. The circulatory and pulmonary systems gave normal results, with the exception of a little emphysema of the anterior margins of the lungs. Pulse 92; respiration 16. The tongue somewhat furred, but at the anterior part of the dorsum a small patch is seen, about the size of a threepenny piece, denuded of epithelium, and appearing raw and glistening. The fauces are slightly congested, but quite moist. The appetite is impaired; bowels are regular. Hepatic and splenic dulness normal. He has sometimes to micturate every half-hour. The urine is pale, almost colourless, faintly acid, sp. gr. 1005; chlorides; phosphates and urea only in small amount; traces of indican; no sugar or albumen, and no organised or crystalline deposits: in short, it exhibits only the character of a very dilute urine. The testicles are rather small. He states that he has occasional nocturnal emissions, and feels competent for sexual congress. He sleeps well, and is intelligent. Cutaneous sensibility unimpaired. On examining the right eye ophthalmoscopically, the optic nerve was found to be atrophied.

The quantity of urine passed daily during the first week after admission was as follows:—

From 3 P.M. Dec. 24th till 3 P.M. Dec. 25th,	420 oz.
„ „ 25th „ „ 26th,	500 oz.
„ „ 26th „ „ 27th,	300 oz.
„ „ 27th „ „ 28th,	400 oz.
From 3 P.M. Dec. 28th till 3 P.M. Dec. 29th,	400 oz.
„ „ 29th „ „ 30th,	330 oz.
„ „ 30th „ „ 31st,	400 oz.

The patient was ordered a good diet, with two pints of milk daily, and as much ice as he chose to take with his liquids. He also took ten minims of dilute sulphuric acid and ten minims of tincture of opium every four hours. This mixture was continued till Jan. 4th, when the amount of urine in twenty-four hours was 366 oz. No good having resulted, twenty grains of iodide of potassium and a quarter of a grain of extract of belladonna were ordered thrice daily. On Jan. 15th it was observed that there was a certain periodicity as to the quantities of urine passed daily, as the following statement shows:—

Jan. 11th to 12th, 228 oz.	Jan. 13th to 14th, 200 oz.
„ 12th to 13th, 272 oz.	„ 14th to 15th, 366 oz.

Five minims of liq. arsenicalis were given along with the iodide. The patient was desired to take as little fluid as possible. He became very fond of the iced milk and water, and was sometimes observed to drink it ravenously. A warm-water or hot-air bath was sometimes administered, and on one occasion the latter induced a slight cutaneous transpiration, limited, however, to the thoracic and axillary regions. This treatment was continued till Feb. 2nd, the quantity of urine daily passed varying from 256 to 856 oz., and the specific gravity from 1005 to 1007; chemical characters as before, except that no indican was discoverable.

During the preceding period he occasionally complained of pain in various parts of his abdomen, back, and under the nipples; these pains were generally relieved by mustard epithems, or friction, sometimes assisted by a carminative. The intestines were on those occasions often inflated, and splashing sounds could be produced by slight manipulation of the abdomen. On Feb. 2nd he was ordered three grains of freshly prepared extract of valerian in pill thrice daily; on Feb. 8th, two pills thrice daily; on Feb. 10th, three pills every four hours. On Feb. 11th he had taken fifteen pills, and felt sick and depressed. On the 14th he took no valerian pills, but from the 15th till the 26th he took six pills daily. The quantity of urine passed during the period the valerian was administered diminished pretty steadily from 308 oz., sp. gr. 1008, on Feb. 4th and 5th, to 240 oz., sp. gr. 1010, on Feb. 15th and 16th.

From this date (the valerian being omitted) till Feb. 26th it steadily increased to 300 oz.

On Feb. 26th the patient was still complaining of great thirst, and the skin was dry. Jaborandi was then ordered in the form of infusion of the strength of one drachm of the leaves and twigs to six ounces of water; of this a dessert-spoonful was taken every four hours. On Feb. 28th a table-spoonful of the infusion was given every three hours; on March 1st a table-spoonful every two hours; March 4th, two table-spoonfuls every hour. On March 5th the skin of the back, abdomen, and inner aspect of the thighs was found to be perspiring pretty freely. On the 6th (the jaborandi being continued as when last mentioned) the skin of the arms and of the left palm perspired. 15th: The quantity of urine has declined steadily from 300 oz. on Feb. 26th to 236 oz. on March 14th. 31st: The treatment with the jaborandi having been continued, the quantity of urine passed to-day was 180 oz. The patient has found his mouth uneasy several times, and the amount of the infusion to be taken (varying from one to two table-spoonfuls every hour) is left to his own sense of comfort or discomfort. His skin is moist, and he declares himself much easier and better in all respects, but still has "some of the old burning feeling in the throat and gullet." April 2nd: The sense of discomfort in the mouth amounts to-day to pain in the teeth and some slight difficulty in opening the mouth. He is ordered to take the jaborandi less frequently.

The quantity of urine continued to diminish steadily till the middle of May, when it amounted to 120 oz. per diem. His mouth also had become moister. The patient was then, at his own request, discharged,

The measurement of the urine in this case was most carefully conducted by the patient and nurse, and latterly by the patient alone, as he became more interested in the progress of his own case. The measurement of the liquids taken was more difficult, and was at first erroneous for obvious reasons, so that the discrepancy between the amount taken and the amount passed was great; but as the thirst diminished, and the man became in earnest as to the measurement of the fluids taken and urine passed, there was seldom more than 20 oz. difference between the one and the other.

Case 2.—(Reported by Fabian Alsop, M.B., resident physician, University Clinical wards.)—William W., aged thirty-five, a clerk was admitted to the Royal Infirmary, Edinburgh, under the care of Dr Laycock, May 29, 1875. He complains of passing a large quantity of urine, and of a desire to pass it frequently. Also of great thirst, and that he feels inclined to drink a great quantity of water at a time. The

water he drinks appears to him to have a sweet taste, especially when it is cold. Patient says that these symptoms commenced nine years ago, during an attack of what the doctor who attended him termed "rheumatic fever." He says that he drank as much water then as he does now. Twelve years ago he had a swelling in the groin after connexion with a woman who would have been likely to communicate infection to him; and five years ago had the venereal disease, for which he was admitted to the infirmary, and, whilst in hospital, had his left testicle removed, and was dismissed cured. Two years after this he was readmitted, and was treated (patient says) for pneumonia. Three months ago a small papule formed at the back of his right thigh, which was not attended to, and which ended in a small ulcer about six weeks ago, and has not yet healed. Ever since his testicle was removed patient has been subject to severe frontal headaches and a feeling of giddiness, which come on him occasionally. His father and mother both died, he states, of consumption; otherwise the family history is satisfactory. He has had a comfortable home and always been well clothed, but has been given to sexual excesses and frequently has been "the worse of drink."

Condition on admission.—Patient is somewhat emaciated, and below the average development; height 5 ft. 6 in.; weight 8 st. 7 lb. His muscles are small and rather flabby. He can lie easily in any position, and is not confined to bed. He has a somewhat anæmic aspect, but his expression is natural. Temperature on admission 97·6°. Skin very dry and rough. Does not perspire at all. No eruptions nor tumours on body. There is a small ulcer, about the size of a florin, on the posterior aspect of the right thigh, with a greyish surface, and which discharges a small quantity of fetid pus; otherwise his limbs are natural. Patient has to micturate frequently, having generally to rise three or four times during the night. Through the day he passes urine, without pain or difficulty, about every two hours, amounting in twenty-four hours to 158 oz.; of a very light yellow colour, much resembling the colour of hock; sp. gr. 1008, of acid reaction; contains albumen, which occupies about one-eighth of the test-tube when the urine is allowed to stand after boiling; chlorides are abundant in quantity, so also is the urea; no sugar present; no tube-casts to be discovered under the microscope. Patient's tongue is clean. He feels very thirsty, and in order to quench his thirst has to drink a large quantity of water at a time. Has a very pleasant feeling at the back of his throat while he is drinking water. His bowels are very irregular in action; some weeks being very constipated, at others loose. Viscera of abdomen natural. Number of respirations 20 per minute. Has no cough nor breathlessness. Physical examination of lungs natural. Pulse

72 per minute; regular in force and rhythm; of fair strength; but slightly compressible. He does not suffer from any dyspnœa or palpitation. Physical examination of heart quite natural. Patient is very short-sighted. On ophthalmoscopic examination of the fundus of the eye, a large staphyloma posticum is observed on the *apparent* inner side of the optic disc; the vessels of the retina are also enlarged, and the choroid is found to be atrophied. By direct illumination the fundus is well seen; and when the observer moves his head in one direction, the retinal vessels appear to travel in the opposite direction. Patient is easily exhausted. Sleeps pretty well at night, and would rest better had he not to get up often to pass water. Occasionally he has frontal headache and attacks of giddiness.

Treatment.—The diet was as follows:—Breakfast: Porridge, milk, coffee, and bread. Dinner: Chop or steak, vegetables, broth, and bread. Tea and bread-and-butter in the evening, and milk at night.

June 2nd. Ordered one tablespoonful of decoction of jaborandi thrice daily.

Progress of case.—The following is a daily table of the amount of urine passed and the amount of fluid taken.

DATE.	Amount of Urine passed in 24 hrs.	Amount of Fluid drunk in 24 hrs.	NOTES.
June 1st	158 oz.	186 oz.	
„ 2nd	154 oz.*	156 oz.	Was up four times to pass urine. Bowels costive. Half an ounce of castor oil in the evening. Jaborandi commenced.
„ 3rd	150 oz.	156 oz.	Bowels moved freely after the castor oil.
„ 4th	120 oz.	146 oz.	Skin very dry; does not sweat at all. Dose of jaborandi increased to two tablespoonfuls. Bowels moved twice. Was up three times last night to pass urine.
„ 5th	140 oz.	146 oz.	
„ 6th	154 oz.	170 oz.	During night sweat a little about face and hands.
„ 7th	148 oz.	186 oz.	Sweat more. Dose of jaborandi increased to four tablespoonfuls three times a day.

* Specific gravity 1008; albumen 1-8th; chlorides abundant; phosphatic.

DATE.	Amount of Urine passed in 24 hrs.	Amount of Fluid drunk in 24 hrs.	NOTES.
„ 10th	100 oz.†	126 oz.	Sweat a great deal about face, but not on body.
„ 18th	110 oz.	116 oz.	Sweat profusely all over his body.
„ 25th	100 oz.	126 oz.	Saliva for last few days very much increased.
July 2nd	104 oz.	116 oz.	
„ 8th	100 oz.	106 oz.	
„ 10th	94 oz.	96 oz.	Sweat very profusely through the night. Saliva greatly increased.
„ 19th	100 oz.	106 oz.	
„ 22nd	98 oz.‡	100 oz.	Patient weighs exactly 9 st.

† Specific gravity 1010; no sugar; albumen 1-6th.

‡ Acid; specific gravity 1010; albumen 1-10th.

These cases are interesting as showing the use of jaborandi in a disorder well known to be intractable. The action of the drug on the skin (probably through the nerve-centres) was well marked; the salivary glands were less influenced.—*Lancet*, August 14, 1875, p. 242.

SURGERY.

FRACTURES, DISLOCATIONS, AMPUTATIONS, AND DISEASES
OF BONES, JOINTS, ETC.

28.—ON RECENT IMPROVEMENTS IN THE DETAILS OF ANTISEPTIC SURGERY.

By JOSEPH LISTER, Esq., F.R.S., Professor of Clinical Surgery
in the University of Edinburgh.

About three years ago my friend, Dr. Stang, of Sorweg, in Norway, being on a visit to Edinburgh, informed me that a new antiseptic had been discovered in Sweden, and was already extensively used in that country for the preservation of articles of food, and also as an application to wounds. The "aseptin," as it was termed, was in two forms, a powder and a liquid, the latter receiving the additional title of "amykos." The composition of the preparations was kept secret; but there was little doubt that they owed their virtue to one common ingredient; and he promised to send me samples of them, in the hope that they might prove useful in carrying out the antiseptic principle in surgery. This promise he at once fulfilled on returning home, at the same time telling me that the active principle of both the articles had been ascertained to be boracic acid, the virtues of which had been discovered by Mr. Gahn, a chemist in Upsala.

It happened that I was just then suffering from onychia of the little finger, attended with excessive fetor, and at the same time exquisitely sensitive, so that even a very weak watery solution of carbolic acid caused almost intolerable pain, while it entirely failed to subdue the pungent ammoniacal odour. I at once gave a trial to the amykos, using it just in the same manner as the former lotion, dropping some of the liquid upon the tip of the finger and wrapping it in lint soaked with the same fluid and covered with gutta-percha tissue. The drops of the amykos, as they fell upon the sensitive surface, caused not the slightest twinge of uneasiness; yet when I changed the dressing, after the usual interval, I was surprised to find an almost entire absence of fetor. Here, then, I had at once sufficient evidence that the new antiseptic, when employed in

the form of watery solution, was both highly efficient and much less irritating than carbolic acid.

Boracic acid was then little more than a chemical curiosity. But I succeeded in obtaining in Edinburgh a sufficient quantity to enable me to test its properties unmixed with other ingredients. A striking instance of its antiseptic efficacy as well as of its therapeutic value was at once presented by a case of pruritus ani of upward of ten years' standing. The affected part was washed with a saturated watery solution at bedtime, and a small piece of lint soaked with the same lotion was applied and retained during the night. The result was immediate relief from the accustomed irritation, and, what struck me as extremely remarkable, the bit of lint when removed next morning, was free from smell. It was afterwards found that even the slight mechanical irritation caused by the presence of the lint might be avoided; for the mere application of a few drops of the watery solution last thing at night, the part being left moist with the liquid, proved completely efficacious; and this simple treatment being continued for a while, the obstinate tendency to irritation gradually disappeared, while the thickening of the folds of skin, which had been of several years' duration, entirely subsided.

Another example of the usefulness of the new remedy was furnished about the same time by a case of inveterate eczema of the ankles in a lady above the middle period of life. The water dressing which she used being removed, a very unusually fetid odour was exhaled from the moist scarlet surface which, tender as it was, she was impelled to scratch by an intolerable sense of itching. Thinking that here, as in the case of pruritus, the irritation caused by putrefaction might be a main element in the obstinacy and discomfort of the complaint, I gave the boracic acid a trial, substituting a saturated watery solution for the water in the dressing previously employed. The effect was at once to correct the fœtor, but in this case the application occasioned a good deal of persistent uneasiness in the sensitive surface. The patient, however, persevered with the treatment, and in a short time the ankles were both in a sound condition, which I was lately glad to learn had proved permanent.

But, striking as were these evidences of the antiseptic virtue of boracic acid, I knew well that in the form in which I had hitherto tried it—namely, in lint soaked with a watery solution—it could not answer for a permanent antiseptic dressing under circumstances where there is at all a free discharge. For the putrescible fluid soaking into the lint would drive the antiseptic before it, and occupy its place, and as soon as this had occurred throughout the thickness of the dressing

at any one point, putrefactive fermentation would be free to spread into the wound. In order that the dressing might be trustworthy it was necessary that the boracic acid should be in some way stored up in it, as carbolic acid is in the resin of the gauze, so that it could not be at once washed out from it by the discharge. A ready means of attaining this object was presented by the fact that the acid, though but sparingly soluble in water at ordinary temperatures, is pretty freely dissolved at the boiling point. Thus at 60° Fahr. water takes up only about a twenty-sixth part of its weight, and at 100° less than a sixteenth, but at 212° more than a third. Hence if a piece of lint is dipped in a saturated solution near the boiling point, it absorbs a great deal of the acid, and, after being allowed to dry, it is found to weigh about twice as much as it did originally, the weight of the crystals disseminated through it being nearly equal to that of the lint itself. If therefore this "boracic lint" is used as a dressing the discharge may soak through it repeatedly without dissolving out all the acid, although it takes up in its passage a sufficient amount to render it antiseptic. It is further a fortunate circumstance that the crystals of boracic acid, instead of being hard and harsh, like most crystals, are soft and unctuous, and therefore occasion no mechanical irritation of the skin.

The boracic lint has proved very valuable in the treatment of ulcers of the legs or elsewhere. In dealing with them, the first step is to cleanse the sore and the surrounding skin once for all from septic impurity. This is done by treating the surface of the sore freely with a solution of chloride of zinc (forty grains to the ounce), and at the same time washing the integument with a strong watery solution of carbolic acid, which is used on account of its remarkable power of penetrating the epidermis, while for the sore itself the solution of the chloride appears to be more efficient. This preliminary step having been taken, the boracic dressing is at once employed as follows:—A piece of oiled silk protective, of sufficient size to cover the sore and slightly overlap the surrounding skin, is dipped in the boracic lotion (a saturated watery solution) and applied, and over this a piece of boracic lint large enough to extend for an inch or more beyond the protective on all sides, the whole being retained in position with a bandage. It is well to soak the boracic lint with the lotion before putting it on, not for the sake of adding more of the acid, but because the lint, when applied moist and allowed to dry on, is less liable to slip afterwards from its position, and also for the purpose of purifying the surface of the lint itself, which in the dry state has no power of acting upon septic dust adhering to it, the acid which it contains being non-volatile, and, therefore, only acting when in solution.

In this dressing the protective serves its usual purpose of preventing as much as possible the direct action of the antiseptic upon the healing part; and although boracic acid interferes with cicatrisation much less than carbolic acid does, the epidermic development proceeds more quickly when it is excluded, while the formation of pus due to the stimulation of the surface of the granulations by the acid (antiseptic suppuration) is of course diminished; and the less the discharge, the less frequently is it needful to change the dressing. The protective also keeps the surface of the sore moist, and so prevents the discharge from being pent up and causing inflammatory disturbance from tension, as is apt to be the case beneath the crust of inspissated pus in a dry dressing. The lint is also kept from sticking to the sore and tearing off the newly-formed epidermis when it is removed.

But it must always be remembered that the protective, in proportion to the efficiency with which it discharges its function of preventing the irritation of the acid, excludes also its antiseptic virtue, so that if putrefactive material exists beneath it at any one point, the septic fermentation will spread over the whole sore. Hence the necessity for having the boracic lint to extend on all sides beyond the oiled silk, for if the protective were to escape at any one place from under cover of the antiseptic layer, it would necessarily conduct putrefaction inwards beneath it. Hence also the importance of adopting thoroughly efficient means of purifying the sore as a preliminary measure.

But if those points are attended to, this mode of dressing will be found to yield excellent results. The epithelial development, protected from needless disturbance, proceeds at a rate altogether unknown under water-dressing, and cicatrisation will often advance steadily in sores which, under ordinary treatment, cannot be got to heal at all; as when, through the unyielding character of surrounding parts, the shrinking of a large granulating surface has put the imperfect textures of the sore upon the stretch, and thus so reduced their vital power as to make them liable to ulceration or sloughing under the influence of stimuli which fail to arrest the healing of an ordinary vigorous sore, such as solutions of astringent salts or the degree of putrefaction that occurs in water-dressing within twenty-four hours. This application also saves trouble to the surgeon, for if properly used, it may be left unchanged for a period varying from two to five days, according to the amount of the discharge.

This last circumstance, together with the unirritating character of the dressing, makes it peculiarly useful for skin-grafting. The manner in which I have for a considerable time carried out

Reverdin's beautiful principle is as follows:—The skin of the inner side of the upper arm having been slightly washed with 1 to 20 watery solution of carbolic acid to purify its surface, a thin layer of the integument is shaved off with a very sharp knife, so as to take barely more than the epidermis, scarcely drawing blood or causing pain. The little shaving is placed upon the thumb-nail of the left hand, moistened with a drop of the boracic solution, and bits not bigger than pin's heads are successively cut off and laid upon the surface with which they are to unite, by taking up each graft upon one side of the point of the knife and stroking the other side of the instrument upon the granulations so as to leave the graft behind. Care must be taken that the deeper surface of the graft is placed downwards, but this is readily done from the fact that the shaving always curls up with the deeper aspect on its concavity.

It is an interesting pathological fact brought out by this mode of procedure, that the surface of healthy granulations is as prone to adhere to freshly-cut perfect tissues as granulations are to coalesce with each other, or the sides of a recent wound to unite by first intention. The practice often followed of cutting beds in the granulations to receive the grafts, very inconvenient from the bleeding which it involves, is therefore wholly unnecessary. The several pieces of epidermis, of which twelve are furnished by a slice a sixth of an inch square, if simply applied to the uninjured surface of the sore, will probably be found to afford as many starting points for cicatrisation, provided that the granulations are healthy to begin with, and that all needless irritation of the grafts is avoided. As regards the former condition, it is a great mistake to wait till healing has considerably advanced, and the sore has become already stretched and weakened by its own contractions; and, as regards the latter point, the avoidance of needless irritation, the stimulus of putrefying materials must be got rid of by thoroughly purifying the sore as a preliminary measure, while the irritation of the antiseptic itself is reduced to a minimum by the dressing employed. In order to make sure against septic contamination during the process of grafting, it is well to cover the sore as soon as it is exposed with a piece of muslin dipped in the boracic solution, and uncover successive portions for the application of the grafts. Then, as each graft is put down, it is covered at once with a small piece of protective dipped in the lotion, and at the conclusion of the process, any parts of the granulating surface remaining exposed are covered in either by separate pieces of protective or by a general piece over the whole, as no harm is done by the layer being double. Boracic lint wrung out of the lotion, and well overlapping the surrounding skin, is then applied, two layers being used at the more

dependent parts if the sore is large and much discharge expected, and a retaining bandage is put lightly on. This dressing is left untouched for two or three days; and when it is changed, all the protective will be found to come off as one piece adhering to the lint, but not sticking at all to grafts or granulations, which are covered with a layer of pus or lymph. This being free from putrefaction or any other irritating property, there is no need to wash the surface of the sore, a process which might disturb the grafts; but without any delay a fresh piece of dipped protective is applied, and over it the moistened boracic lint, any crusts of inspissated discharge on the surrounding skin being afterwards washed away at leisure with the lotion. When the dressing is next changed, the red ring of youngest cicatrix will probably be already apparent around each white epidermic islet.

The trifling wound on the arm which furnished the grafts is treated, like the sore, with protective and boracic lint, and, if these be properly secured, a scar will be found in its place when the part is exposed after the lapse of a few days.

To be able thus to treat recent abrasions with a single application, which may be left undisturbed for an indefinite period, is often a matter of great convenience, especially in the case which so frequently presents itself where such superficial injuries are present as complications of simple fracture. Here, without antiseptic management, troublesome sores are liable to form, requiring frequent disturbance of the splints to gain access to them for daily dressing. But after washing the part with (one to twenty) carbolic lotion, and applying the dressing of protective and boracic lint, the abrasions may be dismissed from further consideration.

It is, of course, essential for the success of this dressing that it should be kept accurately in position. In the case of abrasion in fracture this is probably insured by the presence of the splints, and in large sores upon the legs it is readily done by means of a bandage, especially one made of the antiseptic gauze, which, as before observed, is less apt to shift its place than a common cotton roller. But for small dressings in any situation, and especially about the face, where bandages cannot well be used, it will be found very convenient to fix the boracic lint by means of collodion applied to the edges of a piece of cotton cloth of open texture, sufficiently large to overlap the skin on all sides around the lint. The cloth used for making the antiseptic gauze answers the purpose very well, only it must be employed unprepared, because the resin and paraffin of the prepared gauze would prevent the ether of the collodion from evaporating. In absence of the unprepared gauze, a piece of ordinary rag may be used, if the edges are frayed out sufficiently to give the collodion a proper hold upon the skin.

The boracic lint may often be employed with great advantage as a moist application, soaked with the boracic lotion, and covered with gutta-percha tissue or oiled silk. Foul ulcers, coated with a layer of putrid slough or lymph, if dressed daily in this way, will probably soon assume healthy characters; and when this has occurred, a comparatively slight washing of the sore with the chloride-of-zinc solution will be sufficient for the final purification, preliminary to using the dressing with protective and dry boracic lint; whereas if the chloride is used at the outset, while the sore is covered with its foul crust, a very energetic application is required, entailing hours of considerable uneasiness to the patient.

In deep burns, where from any cause the sloughs have been allowed to putrefy, the moist boracic lint will be found an excellent dressing. In a case lately under my care, the gluteal region having been extensively and deeply burnt, the vicinity of the perineum made it impossible to keep out putrefactive fermentation. Here accordingly a daily dressing of lint, steeped in one part of carbolic acid to thirty of olive oil, and covered with gutta-percha tissue, was employed; but, in spite of this application, the air of the room was pervaded with a strong putrid smell. I therefore substituted for the carbolic oil a dressing of moist boracic lint, and, at my next visit, was glad to find the apartment free from unpleasant odour, although, the sloughs having not yet separated, the emanations would doubtless have been even more offensive than before had the previous dressing been continued. I was, therefore, now able to direct that the boracic lint should be changed only every other day, instead of having the patient disturbed and pained by a daily dressing. And, further, when the sloughs had separated, feeling sure that, by virtue of the boracic acid stored up in the lint, putrefaction would be less advanced in three days under it than it would have been in twenty-four hours under water-dressing, I felt justified in allowing this still longer period of tranquillity.

This is a sufficiently striking illustration of the value of boracic lint as a moist application in all circumstances in which putrid sloughs are present in parts superficially situated, so that the antiseptic can gain access to them. And while the boracic acid gradually dissolved out of the lint by the discharges has this powerful effect in diminishing or arresting putrefaction, it also generally allows cicatrisation to proceed kindly in such parts as are already cleansed of sloughs, though the healing is not so rapid as where the direct action of the acid is excluded by protective over a purified sore.

If much inflammation is present around putrid sloughs, wet boracic lint applied to the sloughs, and a poultice outside this

and extending over the whole inflamed integument, will be found to work extremely well. The boracic lint may be left undisturbed for twenty-four hours or more, while the poultice is changed as often as may be desired.

The moist boracic lint is a convenient dressing after operations upon the penis. Here the frequent exposure of the part for the purpose of micturition makes it necessary to entrust the antiseptic management on each occasion to the patient himself, so that some very simple arrangement is indispensable. With this object a strip of the moist boracic lint may be wound round the organ and secured in position by a piece of thread or narrow bandage, so as to cover the wound but leave the meatus urinarius free; and outside this permanent part of the dressing a loose piece of the wet boracic lint is wrapped and covered with gutta-percha tissue. Then at each time of micturition the patient removes the outer piece of lint, and readjusts it at the conclusion of the act, after pouring over the part a little of the boracic lotion. The unirritating character of the solution of boracic acid to mucous membranes, which is a peculiar feature of this antiseptic, prevents any inconvenience to the urethra from such treatment, which at the same time affords perfect security against putrefaction, yet allows healing to proceed kindly.

The most frequent case of operations in this situation is that for phimosis. It is now about ten years since it was pointed out by Mr. Furneaux Jordan, of Birmingham, that sutures are unnecessary after this operation, and that, after notching the narrow ring of the preputial orifice at one or more situations according to its tightness, and slitting up the inner layer of integument which embraces the glans, to a sufficient degree to permit free retraction, all that is required is to employ a simple dressing and to make a point of having the glans freely exposed once in twenty-four hours; the result being avoidance of the unseemly notch which the stitch, if it really answered its purpose, inevitably occasioned. Ever since the publication of this simple method I have invariably followed it, and, as a rule, with great advantage; but not unfrequently the attainment of the object has been seriously interfered with by inflammatory swelling. But if putrefaction, which is the main cause of disturbance after this operation, is prevented by the boracic dressing, the œdematous puffiness of the prepuce, otherwise so apt to give trouble, is almost entirely avoided, provided that the incisions have been made sufficiently free to allow the utmost facility of retraction. It is, however, essential to the success of the antiseptic dressing that the organ should be thoroughly purified at the outset, as by washing the interior of the prepuce and the glans at the conclusion of the operation with saturated watery

solution of carbolic acid (1 to 20), completely removing any portions of epithelial accumulation adhering about the frenum and corona. A narrow strip of the boracic lint is then wound round the neck of the organ and the retracted prepuce, with the object of keeping the parts in this position, except once a day when the skin is drawn freely forwards and again retracted. But if, as is often the case, there is an insuperable tendency of the skin to slip forwards, the permanent dressing may be dispensed with, the general covering of boracic lint being alone employed, with very free use of the lotion after each act of micturition, together with complete retraction once in twenty-four hours.

Boracic acid may be sometimes used with advantage in the form of an ointment, for which I would advise the following mode of preparation:—Take of boracic acid, finely levigated, one part; white wax, one part; paraffin, two parts; almond oil, two parts. Melt the wax and paraffin by heating them with the oil, and stir the mixture briskly along with the boracic acid powder in a warm mortar till the mass thickens. Then set it aside to cool, after which it will be found to be a pretty firm solid mass, which is to be reduced to the proper consistence of a uniform ointment by rubbing down successive portions of about an ounce each in a cold mortar. This ointment, when used, is spread very thin upon fine muslin or linen rag, which absorbs more or less of the almond oil and leaves a layer of blended wax and paraffin, flexible at the temperature of the body, and separable from the skin with the utmost ease by the discharge, which is thus not at all confined by it, but diffuses itself and flows out beneath it, receiving as it goes an abundant supply of the acid to prevent putrefaction, while cicatrisation is not materially interfered with by the mild antiseptic, and still less by the perfectly bland wax and paraffin.

A good example of the value of the boracic ointment was presented by a case of large rodent ulcer of the face lately under my care in the Edinburgh Infirmary, and treated by excision. The disease involving a large extent of the cheek, both eyelids, both nostrils, a considerable portion of the upper lip and part of the lower one, it was impossible to cover the raw surface by a plastic operation. It was therefore of great importance that efficient antiseptic means should be employed; for there is no more simple or more striking illustration of the value of this principle of treatment than the entire absence of inflammatory disturbance around an open wound when putrefaction is really prevented from taking place in it; the “stimulus of necessity” of John Hunter being, in truth, simply the stimulus of putrefying substances, so that the danger which usually attends open wounds is entirely avoided by

efficient antiseptic measures. But whatever might be the material employed for this purpose, it was inadmissible to interpose a protective layer between it and the raw surface; for this would simply have had the effect of conducting septic fermentation over the entire wound from the sources of putrefaction present at the mouth and nostrils. Seeing, then, that the antiseptic must be applied directly to the divided tissues, it was of course desirable that it should be as mild as possible consistently with its efficiency; and for a situation like this the boracic ointment was much better adapted than the moist boracic lint, the fine cloth spread with it applying itself with facility and accuracy to the irregularities of the surface, and keeping its position without any retaining means except a packing of unprepared gauze applied over it to absorb discharge, and retained by a bandage of the same light material.

The eyeball, left bare by the operation, was protected from contact with the dressing by having the loose skin above the upper eyelid drawn down over it by means of the "button suture," as I may term a form of "stitches of relaxation," which I have used for nearly two years with great advantage. It consists of two oval pieces of sheet lead, about one-twentieth of an inch thick, with a central perforation to receive a moderately thick silver wire. The silver wire is first passed as an ordinary suture, except that it is carried at an unusually great distance from the edge of the wound, both as regards surface and depth; each end of the wire is then passed through the hole in the corresponding lead button, and secured by being wound once round the shorter diameter. The two buttons thus take the place of the tips of two fingers of the two hands in giving support to the deeper parts of the wound, while leaving the cutaneous margins entirely free; and when the wound is at all extensive several pairs of buttons are applied in this way, constituting a sort of interrupted quilled suture. By their means the lips of a wound which otherwise could not be got to meet without considerable tension will often lie in contact of their own accord, any number of superficial sutures being added that may seem desirable to keep the edges of the skin in accurate apposition with a view to primary union.

The larger the surface which the buttons present to the skin the greater is their hold upon it, and the less, consequently, is their liability to glide and allow the wire to cut through the tissues by ulceration. When the circumstances of the wound allow them to be used, as after removal of the mamma, it will probably be found, when they are removed after the lapse of a week or ten days, that the buttons still occupy precisely the same situations that they were originally placed in, the surface beneath them being slightly depressed, but, in consequence of

the diffusion of the pressure, not ulcerated, and this even in cases in which, a large amount of skin having been sacrificed, they have been made to exercise a degree of traction which without experience would seem inadmissible. But much smaller buttons, though less perfect in their action, will often be found of great value in small wounds, as, for example, after the operation for hare-lip, where they take the place of strapping, but work much more effectually and also much more conveniently, as they leave the cutaneous margins free from compression and open for inspection. Here, indeed, at the upper part of the wound the small size of the buttons is attended with little disadvantage, because, being applied to the alæ of the nose in planes nearly perpendicular to the direction of the wire, which perforates the tissue deeply below the septum narium, they cannot glide at all upon the surface, but, retaining their position perfectly, prevent in a very satisfactory manner the stretching of the united tissue at the nostril which is so prone to occur under strapping. In this particular situation, therefore, the only disadvantage of the necessarily small size of the buttons is that, their pressure being concentrated on comparatively small portions of the skin, they will be liable to cause patches of superficial ulceration if the traction upon them should become increased by inflammatory turgescence. But if this threatens to occur, either in this particular wound or in any other, the difficulty is readily got over by unwinding the wire from one of the buttons, and, after straightening it, allowing the button to slip upon it to any degree to which the tension disposes it, and then fixing it again by winding the wire round it. And, conversely, if the support of the buttons is still required after they have become slack from any cause, they can be braced up at pleasure to any requisite degree.

Even when the edges of the wound cannot be made to meet at all, the extent of the exposed tissues and consequent granulating surface and cicatrix may be greatly reduced by the use of the button stitches, as was illustrated by the case of rodent ulcer which we are considering, where a single pair of buttons being applied, one to the skin above the eyelid and the other to that over the lower border of the jaw, the connecting wire lying exposed on the raw surface, the integument thus drawn down formed a permanent covering for the eyeball. — *Lancet*, May 1, 22, and June 5, 1875, pp. 603, 717, and 787.

29.—DEMONSTRATIONS OF ANTISEPTIC SURGERY.

By JOSEPH LISTER, Esq., F.R.S., Professor of Clinical Surgery in the University of Edinburgh.

[These demonstrations were made before the British Medical Association in the Operating Theatre of the Royal Infirmary,

Edinburgh, in August 1875. The first case was one in which Prof. Lister proposed to lay open the knee-joint.]

I need hardly remark, that to do this without antiseptic treatment would be madness—would be a thing which no surgeon would be justified in doing; to make a free incision into the knee-joint and to keep the wound open with a drainage-tube, would be an altogether unwarrantable procedure. We all know that the knee-joint has often been opened by free incision for the extraction of loose cartilages, and that in some such cases, the wound having healed by first intention, all has gone on well without any antiseptic treatment at all; though we know also that this is a very uncertain and dangerous practice. But though it is true that wounds of joints, whether accidental or intentional, may heal without disturbance under ordinary treatment, yet it is certain, that if such wounds were kept open without antiseptic means, disastrous consequences would be inevitable; by keeping the wound open we should take away the only chance there would be, without antiseptic treatment, of the case ending without disaster. But, paradoxical as it may at first appear, with antiseptic treatment the more free the wound, and the more widely it gapes, the more certain you are to avoid inflammatory disturbance in the joint; simply for this reason, that you are the more certain of a free discharge of the plasma effused into the interior. And if you avoid all tension from this cause, and at the same time exclude putrefactive mischief, you have the joint left absolutely free from irritation. Before we bring the patient in, I may say that I shall make the incision pretty free as regards the skin, and carry it gradually down to the joint, so as to be able to see and secure any small artery that may be divided. For if you simply plunge the knife into the joint, and put in a drainage-tube, bleeding may take place into the articulation from some deep vessel, and lead to considerable inconvenience. Just as in Professor Andrew Buchanan's well known experiment, hydrocele fluid is made to coagulate by the addition of a little serum from a blood-clot, so if a very little blood finds its way into the knee-joint, the liquor sanguinis effused from the synovial surface mixing with the globulin of the red corpuscles forms a coagulable fluid and undergoes coagulation, and you have the knee-joint filled with solid matter, which interferes with the rapidity of recovery, although in due time the accumulation disappears by absorption.

[The patient being now brought in, Mr. Lister proceeded.] Here, then, we have before us the distended knee-joint. You observe this peculiar limited special bulging, which, together with the history, makes me suspect that the joint is on the eve of suppuration.

I have said that this case will be an example of the antiseptic treatment in its simplest form. The antiseptic will not be introduced into the joint; it will not be applied to the affected part at all. It will be merely employed externally to prevent the access of septic mischief while we provide exit for fluid from the interior. We shall first purify the skin with a strong (1 to 20) watery solution of carbolic acid, which is best for detergent purposes; water holding carbolic acid but slightly, and very readily giving it up to act upon anything else. Carbolic acid has a remarkable penetrating property. It blends with oily substances and animal matters, and penetrates the hair and hair-follicles, and therefore such a washing as I am now giving will render the skin absolutely pure, surgically speaking. This is a very great point.

In the next place, we shall have an antiseptic atmosphere provided by means of this spray-producer, which acts on the principle of Siegle's steam inhaler. High-pressure steam, issuing by a minute orifice from a boiler heated by spirit-lamp or gas, sucks up a strong solution of carbolic acid by a tube that dips into a vessel containing it, and, blending with it in about equal quantity, forms a 1 to 40 spray.

The part to be operated upon, then, being in an antiseptic atmosphere, if the finger is to be introduced into the wound (and I shall very likely have to pass my finger into the joint) you must take special care that it is an aseptic finger; and this is done by cleansing it with an antiseptic solution, making sure that it passes well into the folds of skin about the nail. And if I should have to introduce an instrument into the articulation, I must see that it is always pure when inserted.

I am more and more persuaded, the longer I practise antiseptic surgery, that the chief essential to success is a thorough conviction of the reality of the presence of the septic matter on all objects in the world around us.

[Mr. Lister then proceeded to perform the operation. Some small arteries, which bled in the incision, were secured with fine prepared catgut, and the joint having been opened, two drainage-tubes, each about $\frac{1}{4}$ inch in diameter, were inserted side by side; an obstructing band within the articulation being divided by a probe-pointed knife guided by the finger so as to permit them to be introduced fairly into the cavity. He commented on the various steps as he proceeded, urging again the absolute necessity of having all the instruments thoroughly aseptic, and went on to say]—One learns after a while to do these little purifications instinctively, but at first it requires thought, intelligence and constant care, particularly to any one who has been in the habit of operating without having to attend to these minutiae. Would that we could get rid of all compli-

tions in the system ! If we could dispense with the spray, no one would rejoice more than myself ; but until somebody wiser than I am can supply some better means, we must continue to use it. There is, I find, considerable thickening of the textures in the vicinity of the joint, and this is the cause of the swelling which is still apparent, though the synovial capsule is now empty. The outer orifices of the drainage-tubes are made transverse or oblique, as required, in order that they may lie flush with the surface of the skin, and when retained in this position by means of the threads which you see attached to their margins, they discharge their functions perfectly.

The operation having now been performed, the next point is so to dress the wound as to make sure that nothing septic will get in before next dressing ; this must be not a matter of hope but of certainty. The material which we have used for some time past is an open cotton cloth, with the fibres impregnated with a mixture of carbolic acid and common resin. Common resin holds carbolic acid with extreme tenacity, and in consequence of this gives it off so slowly as to be unirritating to the skin ; yet at the temperature of the human body it furnishes a sufficient supply of the acid for a trustworthy antiseptic dressing. But at the ordinary temperature of the air in this country, the antiseptic is evolved so slowly from the gauze that the fermentative energy of septic dust is not at once extinguished by falling upon it, as it is by mingling with a strong watery solution ; and if the gauze were applied dry, some active septic particle, adhering to its surface, might enter the blood or serum at the outlet of the wound, and propagate putrefaction to the interior. There was a time when I used to have occasionally in my practice putrefaction which I could not explain, but which I afterwards saw must be due to this cause, and the difficulty was then at once overcome by dipping the lowest piece of gauze in a watery solution of carbolic acid. This solution which I am now using, having been mixed with blood from the wound, has a very dirty appearance. A surgeon, who went round my wards some time since, expressed astonishment that I should use dirty lotion to wash a wound, and to purify what I was placing upon it ; but the wound, although æsthetically dirty, was surgically pure, and the lotion had not been made impure by being used for washing it. Even if it had been otherwise, we might have trusted the carbolic acid to purify it. Why then should we waste good lotion ? I dip, therefore, in the lotion this piece of gauze that I place next to the wound, and thus make perfectly sure that nothing septic is applied to it.

It is most important that the spray be properly directed during the dressing. I have seen a surgeon expose a serious

wound, involving injury to the brain, while the spray was only playing on the opposite side of the head. It were far better that the antiseptic method should not be employed at all than that it should be used imperfectly. For such attempts not only end in disappointment, but throw discredit on the system. Some people seem to say, "I have tried the thing and failed, and therefore, of course, the system is all nonsense." I have seen it fail in my own practice, but under such circumstances I have always thought that there must have been some mistake on my part, and I have endeavoured to discover where my mistake lay. But that does not seem to be the way in which the matter is viewed by some of our professional brethren.

A small piece of gauze dipped in the lotion having been placed next the wound, the dressing on which we rely for excluding putrefaction is applied in the form of eight layers of the gauze, sufficiently broad, as you see, to cover the surrounding skin for several inches in every direction; and beneath the outermost layer is placed this piece of thin Mackintosh cloth to prevent the discharge from going directly through the dressing; because, if a considerable quantity went through, strongly as the resin holds carbolic acid, it might be all washed out before twenty-four hours had elapsed, and then putrefaction would spread inwards to the wound. The dressing is secured by a bandage, for which strips of the antiseptic gauze prove very convenient. Now we are perfectly sure, that if we have left nothing septic in the wound, we shall find no putrefaction when the dressing is changed to-morrow.

[The subsequent progress of this case has illustrated well the remarks made at the demonstration, with regard to the effects of a free opening, or the contrary under antiseptic management. When I saw the patient on the following day, I learned that he suffered unusual pain in the afternoon after the operation, which became very severe during the night, and though somewhat less in degree at the time of my visit, was still very considerable. The temperature had risen on the previous evening to 102.4° F., and was now 101.8° . Such a state of things would at one time have alarmed me, and would have made me fear that putrefaction had occurred. This, however, I felt confident could not have been the case, and another probable explanation suggested itself. The peculiar bulging above alluded to, situated over one of the pouches of the synovial capsule beside the ligamentum patellæ, had tempted me to make the opening in that situation; but the bulging part collapsing on escape of the fluid, the only way in which I could ensure complete introduction of the drainage-tubes into the joint was by passing their ends under the ligamentum patellæ; and I thought it not unlikely that they might have been compressed, and their function so interfered with. Accord-

ingly, on changing the dressing, I found that the gauze presented a bloody stain, which appeared sufficiently accounted for by oozing from the surface of the wound, while the joint was fully distended. And it appeared that the disturbance to which the articulation had been subjected had led to unusually rapid effusion from the synovial surface, and this being unable to escape, had produced great tension, attended with pain and fever. I at once placed him under chloroform, and made a fresh incision at the outer side of the limb into the pouch above the patella, and introduced a drainage-tube larger in diameter than the little finger, after pressing out the clear serous and fibrinous contents of the capsule. This was of course done with antiseptic precautions, and a dressing like that employed the day before was applied. The result was that almost immediately after awaking from the chloroform sleep, he felt himself entirely relieved of his pain; and not only has that which was induced by the first operation left him, but he has entirely lost that which had annoyed him for so long a period previously. The temperature in the evening was found to have fallen to 99° F., and has since remained normal, and the discharge, which has continued to be merely serous, has so diminished in quantity, that when I last saw him (15th August,) I substituted a drainage-tube of medium size for the large one, and was able to direct that an interval of three days should be allowed to pass before the next dressing. I must add, that he has tested the limb, contrary to orders, by getting out of bed and resting his weight upon it, but without any of the pain which he formerly experienced on so doing. In all other respects he is in perfect health.*]—*Edinburgh Medical Journal*, Sept. 1875, p. 193.

30.—ON SUPRA-CONDYLOID AMPUTATION OF THE THIGH.
By Dr. WILLIAM STOKES, Professor of Surgery, Royal College
of Surgeons, Ireland.

I deem the following cases worthy of record, not only on account of the clinical interest attached to them, and the results which were obtained after supra-condyloid amputation, but mainly because I believe these results will tend to confirm the high opinion that is held of that operation by all surgeons who have performed it. These reasons induce me to draw attention again to the advantages which I consider may be claimed for the procedure—advantages which render it, in my opinion, decidedly preferable to the knee amputations of Velpeau, Syme, Gritti, and Carden, and also to the operation

* Mr. Lister brought other interesting cases forward to show the value of this treatment.

of excision of the knee-joint, being attended with far less risk to the patient than that procedure—one which is ever fraught with the greatest peril to those on whom it is performed, and, notwithstanding the enthusiastic but, I think, extravagant praise that at times has been lavished on it as a mode of proceeding, disappointing in its results, and inferior to the operation I now advocate.

Case 1.—Michael W., aged twenty-eight, by occupation an ironmonger, was admitted into the Richmond Surgical Hospital, under my care, on the 8th of last August. The first appearance of the disease from which he suffered—necrosis of the upper third of the tibia, preceding chronic synovial inflammation of the knee-joint—was in the year 1870. The patient stated that in that year several pieces of bone came away through various sinuses situated on the anterior and internal aspects of the upper portion of the shaft of the tibia. In the following year the knee became affected, and two years subsequently amputation was suggested to him, but at that time he would not consent to the operation proposed. He then came up to Dublin, and was admitted into the Richmond Hospital. At the time of his admission the sinuses I have already spoken of had healed, and what appeared chiefly to call for surgical treatment were the synovial effusion and thickening. For some time I entertained the hope that by rest, vesication, iodine, and the internal exhibition of anti-strumous remedies, I might possibly succeed in saving the limb. I accordingly put the limb up in a gypsum bandage, adopting the Bavarian method, which has been so strongly advocated by my colleague, Dr. Corley, and followed out the treatment I have already alluded to, the details of which need not be discussed. This I continued for nearly two months, and then finding that no improvement had taken place, but rather the reverse, the sinuses having re-opened and revealed the existence of extensive osseous disease, I recommended amputation. As there was no evidence that the disease had involved either the patella or lower end of the femur, the case appeared to me adapted for supra-condyloid amputation of the thigh, and, assisted by my colleagues, Mr. Hamilton, Dr. Thomson, and Dr. Thornley Stoker, this operation I accordingly performed on the 7th of last October, Esmarch's bandage having been applied, and chloroform administered. The operation was as bloodless as it was painless, and I may mention here an observation made by my late revered colleague, Professor Adams, on this occasion. "It is the first time," he said, "in which I have witnessed an amputation of the thigh during which the patient did not give a single moan, or lose a single drop of blood!" As regards the steps of the operation, I may mention that, save in one

particular, to which I shall presently allude, I followed rigidly the rules mentioned in former communications on this operation made to the Medico-Chirurgical Society of London and the Surgical Society of Ireland. As regards the progress of the patient after the operation, there was nothing noteworthy, except that the union of the wound was exceptionally rapid.

To Professor Velpeau is undoubtedly due the credit of first pointing out the advantages to be derived from amputation at the knee. Among these may be mentioned that the weight of the body can be placed on the face of the stump; that the hip-joint preserves all its movements, the patient not being obliged to walk as if the hip-joint were ankylosed; and that the shock is not so great as after the ordinary amputations of the thigh.

The modifications of this operation, introduced by Professor Syme and Mr. Carden, were the next that were introduced into surgical practice, and subsequently the modification of Carden's operation, which is known in Continental schools chiefly as Gritti's amputation; and, lastly, the operation which is the subject of this communication.

I may briefly state the advantages that I think may be claimed for supra-condyloid amputation, which name I have selected in order that surgeons should bear in mind the necessity of making the femoral section *above*, and not through, the condyles, as in Syme's, Carden's, and Gritti's amputations. These advantages are those which it has in common with the other amputations at the knee and those which are peculiar to itself. Among the former I may mention:—

1. The stump being more useful for progression in consequence of the possibility of making pressure on its extremity, and the patient not being obliged to walk as if he had an ankylosed hip-joint, as is always the case when the point of support is at the pelvis. As Dr. Markoe says:—"To the poor man this single circumstance makes all the difference, between his being able to earn his living by active employment and his being laid up for life a hopeless cripple. To the rich man who is able to secure the aid of an artificial limb, it makes the difference between a point of support at the knee and a point of support at the ischium. In fact, it is practically the difference between amputation below and amputation above the knee."

2. The diminished liability to the formation of tubular sequestra.

3. The operation is less hazardous, being further removed from the trunk than the ordinary amputations of the thigh.

4. The shock is less than in the higher amputations, as the muscles which are divided are few in number, and being cut, not through their fleshy bellies, but at their tendinous extremities.

5. Less liability to suppuration.

6. Less liability to osteo myelitis, from the medullary membrane not being interfered with.

The special advantages of supra-condyloid amputation are—

1. That the posterior surface of the anterior flap is bound with a natural synovial lining, which I feel confident largely diminishes the chances not only of subsequent exhaustive suppuration, but also of purulent absorption.

2. Any possibility of the split patella shifting from its place on the cut surface of the femur is prevented by the high femoral section, and by stitching the two bones together in the manner I have described.

3. The existence of an osseous curtain, which is formed by the split patella covering the cut surface of the femur, diminishes probably the chances of pyæmia, and is not liable to slough away as the periosteal curtain as recommended by Von Langenbeck undoubtedly is.

4. The vessels are divided at right angles to their continuity, and not obliquely, as they are in other flap operations.

5. The existence of a posterior flap diminishes the chances of any wide gaping of the wound posteriorly, while the anterior flap, being oval, increases the chances of the stump tapering gradually towards its extremity, and assuming the form of a rounded cone.

6. The preservation of the normal attachments of the extensors of the leg.

To Professor Velpeau is due the credit of first recommending the preservation of the patella in amputations at the knee-joint, and this recommendation was adopted subsequently by Lane, Blenkins, and Markoe. To Gritti is due the credit of drawing attention to the fact of the great advantage that is derived from having the patella fixed, in order that there should be a firm standpoint on which the extensors may act. The operation, however, as practised by him, was in many respects a defective procedure, was attended, as Prof. Rizzoli informs us, with a high rate of mortality, and consequently soon fell into disrepute.

In supra-condyloid amputation, which is the outcome of the procedures I have alluded to—notably those of Velpeau, Syme, Carden, Gritti, and Rizzoli—I have retained the advantages observable in these operations, and eliminated what experience has shown to be defective in them, and the result obtained in my hands, and in those of my colleague, Professor Macnamara, and the other eminent surgeons who have performed the operation, lead me to the conviction that it must be conceded that, in supra-condyloid amputation, a signal advance has been made in operative surgery. It is a source of much gratifica-

tion to me to be able to state that Mr. Wheelhouse, one of the eminent surgeons of the Leeds Infirmary, considers that supra-condyloid amputation possesses “advantages which render it *decidedly superior to any other known method of amputation of the limb*, and which render its adoption almost, if not quite, imperative.” This opinion was given in 1872; and wishing to know in what estimation the operation is still held in Leeds, I wrote to my friend Mr. Jessop, one of the first, if not the very first, who practised the operation in England, and he observes:—“The supra-condyloid amputation fully maintains its repute here; I see no reason whatever to alter the opinion I expressed to you some time ago as to its merits. Whenever a suitable case presents itself, I prefer it (the supra-condyloid) to Carden’s, as well as to *all other forms of amputation* in the immediate neighbourhood of the knee-joint.”

Every surgeon to whom I have shown the results I have obtained by this procedure has borne evidence as to the great shapeliness of form in the stumps, their appearance, and remarkable applicability for the adjustment of prothetic mechanical appliances. In truth, of the amputations in the neighbourhood of the knee-joint, supra-condyloid amputation undoubtedly affords the most satisfactory results; and, more important than all, is the operation of its kind which is attended with the minimum of risk to the patient’s life.—*Dublin Journal of Medical Science*, August 1875, p. 97.

31.—ON THE TREATMENT OF FRACTURES OF THE LOWER EXTREMITIES.

By JAMES SPENCE, Esq., F.R.S.E., Surgeon in Ordinary to the Queen in Scotland.

Looking at some of the more prominent recent changes in surgical practice, a superficial observer might almost imagine that instead of progressing, our science moved in a cycle; and were he inclined to be cynical, he might suggest that we had revolved back to the period of sheer mechanical forces, complicated dressings, and red-hot knives. A nearer and more appreciative examination will show us, however, that even in cases where the principle is not new, the method of applying it has been so modified and improved as to constitute a real advance and addition to our resources. Let me take, as an example of this, a method of treating fractures of the lower extremity now much used—extension by weight and pulley.

The great tendency to shortening and deformity in cases of fracture of the thigh-bone, owing to the contraction of the powerful muscles which surround it, could not but attract the

attention of those called upon to treat such injuries; and hence, from the earliest times, surgeons were naturally led to try and overcome the displacing causes by opposing force to force by means of *extension* and counter-extension. The principle of extension is now almost universally admitted to be best in these fractures; but the method by which it is applied makes all the difference. Those who first applied the principle seem to have had in view rather what mechanical forces could effect, than what the living body could bear. You have only to look at the formidable machinery they employed for the purpose, such as the bed of Hippocrates, the "organon," and the various forms of glossocoma,—different kinds of racks and windlasses, in fact,—to understand how a revulsion of feeling in the profession should have at one time led to the abandonment of the extension treatment in fractures of the thigh-bone, and to the adoption of the method of laying the limb on its outside, with the leg bent on the thigh, and the thigh bent on the pelvis—a principle of relaxing powerful muscles which had proved most useful in fractures of the leg, but which, for obvious causes, proved most disastrous in those of the thigh. The abuse of a power is not a reason for abandoning its use: we would do better to examine into it, and try whether it be not capable of improvement. I fear, however, human nature has a bias to extremes; and so we often miss making improvements on methods of treatment until they suddenly reappear as novelties, and are accounted, and properly so, as marks of progress. Mr. John Bell, in his great work on Surgery, speaking of the machines used in treating fractures, says: "I may, perhaps, do you some service by explaining the simple principles of this department of surgery; and then you will be able to enter the magazines of Scultetus, Hildanus, and Parceus, filled with engines not unworthy of the chambers of the Inquisition, without being tempted to bring out along with you any of their lumber." Accordingly, he does enter the magazines of apparatus, and criticises them with his usual scathing sarcasm. Amongst other "lumber," he unhangs from the walls of the magazine of Hildanus a weight with circle and strap for hanging from the ankle, and drags to light a bed with a surscingle or perineal band of horse-girth for fixing the body to the upper part of the bed; and on this rude apparatus for permanent extension he makes ironically laudatory remarks. Mr. Bell would have been better employed if, when he exhibited the rude apparatus of Hildanus, and admitted its power of maintaining permanent extension, he had thoughtfully considered how it might be modified so as to get rid of its defects, and be converted into a simple and effective means of treating fractures of the lower extremity. Let me again take

the dust off this bed and weight of Hildanus, and place them alongside some modern surgical upholstery, and see how like they are. Here is the weight and pulley method copied from a recent work on surgery. How very like! The perineal band or surscingle fixing the patient; the weight hanging from the foot through the pulley fixed at the foot of the bed. But how is the weight hung from the limb? No longer by a circular strap round the ankle, acting on one part only, and so unendurable, but to long plasters fixed to and embracing a great breadth of the limb from immediately below the fracture, and so diffusing pressure that the patient feels no inconvenience, and is scarcely sensible of the extending force. That makes the difference. But something is still wanting to its perfection. Can we get rid of that perineal band, which proves so troublesome to patient, and surgeon, and nurse? How can we dispense with it, and maintain a counteracting force to the extension from the foot? Tilt up the lower end of the bed; place blocks of wood below the feet of the bed; take off the perineal band, and let the body be the counter-extending force; and there you have the simplest, least irksome, and most perfect method I know of treating fractures of the thigh, and, if possible, still more useful in treating oblique fractures of the tibia.

Until a comparatively recent date, I seldom used anything but the long splint for the purpose of extension and counter-extension; and several years ago I drew special attention to what I considered essential to its proper use—viz., maintaining a moderate amount of extension during treatment, more especially when the fracture was oblique; and, so far as the results of my practice were concerned, I had little reason to abandon the long splint for any other method. But it is impossible for anyone who has had much experience in its use not to feel that it had defects, and that much care is required to prevent troublesome results, and to overcome some difficulties. I may mention, for example, the tendency to fretting and excoriation of the soft parts caused by the perineal band or extensor, and by the handkerchief which was generally used for fixing the foot to the splint. Nay, unless great attention was given, the pressure of the handkerchief sometimes gave rise to sloughing, especially in old or very young patients. Indeed, for some years before I began to use the pulley-extension, I had used plasters as the means by which I fixed the foot to the lower part of the splint, so as to obviate the bad effects of the handkerchief round the ankle and instep, and also as maintaining extension in a more direct line, and preventing any eversion of the foot; and I would strongly urge this modification whenever the long splint is used. But there still remained the

inconvenience and irritation caused by the perineal band, and the frequent necessity of changing it for cleanliness; and when this band is removed, of course all extension and counter-extension cease for the time, unless kept up by assistants; and there is risk of displacement occurring. Another troublesome, though less serious, effect was the stiffness of knee when the splint was removed at the end of six or seven weeks; and, in some patients of rheumatic diathesis, or those who would not tolerate early passive motion being used, I have known a considerable amount of stiffness remain for years. I confess that my predilection for, and my favourable experience in the use of, the long splint, made me very unwilling to abandon it; but, having to treat a compound fracture of the thigh where the wound was so placed that even the bracketed long splint could not be used, I tried the extension pulleys, and found that method so effective, that I tried it in ordinary cases, and have found it so simple and effective, so much more comfortable for both patient and surgeon, that I now rarely use the long splint—almost never, except for clinical instruction, that students may see more than one method of treatment. Now, after some years' experience in the use of the extension-pulleys in fractures of the thigh in very young children and in adults, in fracture of the neck of the femur in old persons, and in long oblique fractures of the tibia, I unhesitatingly commend the method to all who may not have tried it. Of course, in fractures of the shaft of the femur, lateral splints are required, just as when we use the long splint, and also for lateral support in fractures of the leg. When there is much bruising, however, I merely use sand-bags to prevent lateral displacement; and I also prefer deep sand-bags to prevent rolling of the limb outwards in fractures of the thigh, to a long lateral splint, as used in America. In fact, the full advantages of the extension-pulley method are only secured when we abandon the perineal *lacque* and long lateral splint, and make the body the counter-extending force.

Looking at the extension method, as thus improved and simplified, I think we may fairly reckon it as progress in a most important department of surgery; but whilst we congratulate ourselves in our advance, and replace the bed and weights of Hildamus in the *armamentarium antiquorum*, let us regard it not as "lumber," but reverently with the homage due to the perception of a true principle, however rude in design and execution the apparatus may be.

The use of plasters, as enabling us to fix apparatus, is capable of numerous applications; and in transverse fractures of the patella I have used it with advantage to enable me to

approximate and retain the fragments, by means of Malgaigne's hooks, without penetrating the skin.—*Medical Times and Gazette*, Aug. 21, 1875, p. 204.

32.—OPERATION FOR UNUNITED FRACTURES.

By Dr. MATTHEW HILL, Liverpool.

This operation is a modification of Dieffenbach's, which consists in cutting open the fracture and then inserting ivory pegs into the bone, with the object of exciting such an amount of action therein as will result in the throwing out of reparative material to be afterwards developed into callus. Before describing the operation, it is desirable to take a cursory review of the different methods—and their name is legion—which from time to time have been adopted to cause bony union in these obstinate cases. These measures may be conveniently classed under three heads: First, those which do not alter the fracture from its simple or unexposed condition, such as blisters, stimulating embrocations, friction of the fragments against each other, malleting the fracture externally, and subcutaneous scarification of the bone ends. In the second class may be included such proceedings as may be called *transitory*, that is to say, while they cause some slight communication of the fracture with the external air, and are often accompanied by suppuration, yet do not absolutely expose the bone; such are the setons, cauteries—actual and potential, and the steel skewers and screws which have been used to transfix the fragments, but project through the flesh. Lastly, in the third class must be placed those operations which, to all intents and purposes, render the fracture “compound,” such as Dieffenbach's, and the various plans for resection with or without subsequent wiring together of the denuded bone ends. Any and all of these proceedings require to be aided by some immovable form of apparatus which shall fix and steady the limb—for in the limbs alone is interference required. It is obvious that any procedure which shall convert the dangerous and tedious, but mostly effectual, remedies of the third class into the safer category of the first class, should be an acquisition to surgery, and this is what the new operation purposes to effect. Of course it is understood that the more severe and radical operations should be deferred until the milder ones have been tried and failed; but in many instances, especially in the femur and humerus, it is “advisable not to employ the seton, but to pass on at once to Dieffenbach's plan,” as being attended with less danger. In Dr. Hill's patient the femur was fractured ten weeks before coming under his care. Powerful grating of the fractured ends together was then tried, but pro-

duced no result; a like want of success followed subcutaneous scarification. Dieffenbach's method being next determined on, the author conceived the idea that it could be done subcutaneously, thereby avoiding the tedium, trouble, and danger of a large and deep wound. The necessary tools are an Archimedian drill-stock, a steel drill four or five inches long, and a few ivory stilettes of the same length and diameter (or slightly tapering) as the drill. The drill and stilettes are similarly graduated in half-inches, and the ivories are, moreover, grooved like a director, in order to slide along the drill. The *modus operandi* consists in entering the drill through a puncture made by a tenotome down to the bone; the depth of the soft parts is now read off by means of the graduations, then if it be desired to bore into the bone to the depth of an inch, the drilling is proceeded with until the steel has penetrated an inch further than the original reading. The ivory stilette is now filed *half-way through* an inch from the point, and after being soaked in carbolic oil is guided by its groove down along the drill to the brink of the perforation in the bone, from out of which the steel is next lifted, the ivory slipped into its place, hammered, and by a smart lateral motion broken off at the filed notch. The operation is completed by withdrawing the remainder of the stilette and sealing the puncture with a bit of lint and plaster. Thus an inch peg is accurately placed in an inch hole, leaving no portion projecting into or from the flesh. The graduations on the ivory are for the purpose of comparison with the depth indicated previously on the drill, and it should be observed that the readings tally before the stilette is broken off. The reason why the stilette is grooved instead of the drill is that when the peg is driven home a channel is thus provided for the escape of inflammatory fluids, which would otherwise be pent up in the bone. By the means first detailed three pegs were successfully inserted around the fracture—one in the upper and two in the lower fragment; the punctures healed kindly in twenty-four hours without the development of pus or any constitutional disturbance; even the local irritation was far less than expected or desired. Whether the result to the patient be successful or not, the practicability of subcutaneous pegging has been safely demonstrated, and it should be borne in mind that in the event of diffuse inflammation or abscess supervening in any other case, requiring the fracture to be laid open, the patient is only in the position which Dieffenbach's mode of operating has hitherto necessitated.—*Medical Press and Circular*, Sept. 5, 1875, p. 210.

33.—REMOVAL OF THIRD METATARSAL BONE: ANÆSTHESIA BY CHLORAL-HYDRATE.

By G. J. S. NAIRNE, Surgeon, and ALEX. NAIRNE, Physician,
Glasgow.

On April 1st, 1875, Christina D., aged $3\frac{1}{2}$, a delicate-looking girl, was put under the influence of chloral, and had the third metatarsal bone of her left foot removed for disease. The operation had nothing special to note, but the narration of the administration of the chloral may be interesting.

An aqueous solution was prepared, of the strength of twelve grains to twenty minims. A solution of strychnine (two grains to the ounce), was also prepared. At 10.30 a.m., ten minims of the chloral solution were injected subcutaneously into the right lower leg. At 10.38, there was no perceptible effect; the child cried continuously. At 10.40, ten minims more were injected subcutaneously into the lower part of the left leg, and the child was given to its mother to carry about. At 10.45, the patient was drowsy, but easily roused; she started and cried whenever the mother would lay her down. At 10.55, ten minims more were injected; at 11, she was sleeping apparently soundly. There was no flushed face, but the pulse was rather quick. She awoke and cried. At 11.5 ten minims were administered by the mouth. She dropped off to sleep in a few seconds, and began to snore. Pinching made her cry, but she fell asleep immediately. At 11.18, ten minims more were administered by the mouth. At 11.20, she was in a deep sleep.

The operation was now performed. During its performance she began to cry, but made no struggling to speak of; the eyes remained nearly shut, and the crying seemed that of a dreaming child. Immediately she fell asleep again as sound as ever. Strong tea was prepared, of which she was made to drink a cupful. Her pulse was quick but firm, so we let her alone. She slept deeply for over two hours. More strong tea and milk were then given her, and, in another three-quarters of an hour, she sat up dazed, looking quite unterrified, and apparently oblivious to any pain. Next morning she took her porridge and milk with quite a good appetite.

Altogether, the administration of chloral seemed better than that of chloroform—in this instance, at least. There was no convulsion, nor apoplectic appearance, and no unnatural disturbance of the breathing. There was no subsequent sickness nor any apparent ill effects. We conceive that chloralism would be much safer and better than chloroforming in ophthalmic operations.

We were glad we had no cause to use the strychnine, but

would not have hesitated to inject it subcutaneously if there had appeared any necessity. We have administered strychnine frequently after chloroforming, and generally found an immediate good effect in brightening up the patient and preventing sickness. Subcutaneous injection would, therefore, very likely be successful in restoring animation in cases of chloroform poisoning.

Next time we use chloral we intend to have a much more dilute solution, and a larger syringe, and to inject it into a vein. By these means, we hope to avoid the pain caused by the injection, provide as far as possible against phlebitis, prevent the formation of painful swellings or ecchymoses, and secure the more immediate introduction of the fluid into the circulation. Total unconsciousness does not seem at all necessary to produce anæsthesia, as, although the girl woke up and cried during the operation, she made no struggling, and was asleep before her cry was finished.—*British Medical Journal*, June 26, 1875, p. 845.

34.—ON A NEW OPERATION FOR THE CURE OF CERTAIN CASES OF AGGRAVATED “KNOCK-KNEE.”

By THOMAS ANNANDALE, F.R.S.E., Surgeon to the Edinburgh Royal Infirmary, and Lecturer on Clinical Surgery.

On the 3rd of March last, a little girl, æt. 6, was brought to me from Glasgow, on account of a serious deformity of her right leg. Mechanical means had been employed for two years with the object of relieving the condition, but without success, and the deformity was steadily increasing in severity.

A careful examination determined an aggravated form of “knock-knee,” and it was found impossible, in any position of the limb, to bring the leg into a straight line with the thigh, the head of the tibia forming a considerable angle with the condyles of the femur. The femur had a distinct bend inwards and forwards about the junction of its lower and middle thirds, and the condyles of this bone were much more oblique in their direction than in the natural condition. In Fig. 1 the position of the bones is illustrated diagrammatically. The adductor muscles were somewhat contracted, and the distortion was such that the patient walked with difficulty. The left limb was well developed and natural in position. A study of the case convinced me that the oblique position of the condyles, the result apparently of the bending of the shaft of the femur, was the principal obstacle which was preventing the tibia and leg being brought into line with the thigh, and it therefore seemed to me, that if this obliquity could be removed, the deformity might be cured or very much relieved.

Two ways of removing this obliquity suggested themselves. The first was to divide the shaft of the femur at the point where



Fig 1.

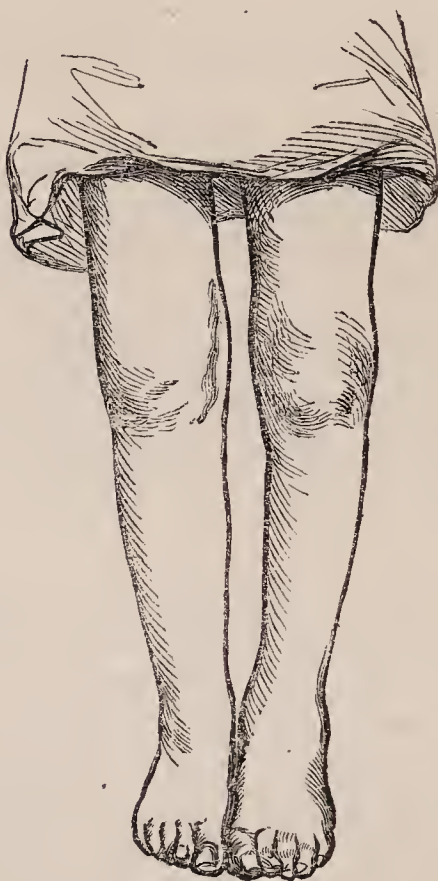


Fig. 2.

bent; the second, to remove an oblique slice of the condyles. The latter operation would be attended with more risk than the former, because it necessitated the incision of the knee-joint. But some little observation decided me to adopt the latter proceeding, for I felt sure that it would be more effectual than the former, and I trusted that the risks of opening into the joint would be counteracted by the careful use of the antiseptic treatment.

The consent of the child's parents having been obtained, I operated on the 16th of March in the following way:—

An incision, about five inches in length, was made along the inner aspect of the knee-joint, the articulation opened into, the internal lateral ligament cut across, and the patella and its ligament being drawn outwards, the crucial and external lateral ligaments were also divided. An oblique slice (illustrated by the dotted line A in Fig. 1) was then sawn off from the condyles of the femur, the tibia not being interfered with. After the removal of this slice of bone, the leg was readily brought into a

straight line with the thigh; and a drainage tube being inserted into the cavity of the joint, a few sutures were applied, and the limb placed on a wire splint, in the straight position. The whole operation was performed under the antiseptic spray, and the usual antiseptic dressing was applied to the wound.

Some suppuration of the wound followed the operation, but this gradually ceased, and, on the 24th of March, the discharge was so slight that the dressing was changed only once in two days. On the 25th of April, the wound was quite superficial; and on the 29th of this month, the wound was soundly healed. On the 6th of May, the patient was allowed to get out of bed, the joint being supported by lateral splints, which were removed daily to permit of passive movements of the joint being made. On the 30th of May, the splints were entirely removed, and the patient allowed to bear weight on the limb. At this date, the limb was perfectly straight, and of equal length with the opposite one. The lateral mobility of the joint was very slight, and very much as in the natural condition. Flexion and extension were very limited. Fig. 2 is a careful copy of a photograph which was taken at this time.

On the 5th of June, I placed the patient under chloroform, and forcibly bent the knee to rather more than a right angle, and I also moved the joint freely, so as to break down the adhesions which had resulted from the operation. No bad consequences followed this forcible bending of the knee; and two days after, the patient was again going about the ward with the help of crutches, and able to bear weight upon the limb, the mobility of the joint being decidedly improved.

Remarks.—I am not aware that this or any similar operation has been before practised in cases of knock-knee, but the successful result obtained in the case reported, encourages me to recommend this method of operating in certain aggravated cases of the deformity which have resisted the division of the biceps tendons, or other tense structures, and carefully-applied mechanical treatment.

The employment of the antiseptic treatment in this and similar operations I consider most valuable, and I must confess that it was my confidence in this treatment which led me to freely incise so important a joint, and to carry out the proceeding described.—*Edinburgh Medical Journal*, July 1875, p. 18.

35.—THE CURE OF BENT KNEE AND THE IMMEDIATE TREATMENT OF CONTRACTED JOINTS.

By Dr. J. MORGAN, Surgeon to Mercer's Hospital, and Professor of Anatomy to the Royal College of Surgeons, Ireland.

I here introduce the method adopted as a bone-setter's method, taken from Mr. Hood's book.

The operator, as will be perceived, grasps the heel of the patient between his knees, the inner condyles resting on its sides, just below the ankle-joints. By this means the foot serves as a lever to rotate the leg; the hands grasp the knee and the thumb is situated upon the painful point, which, in bone-setter *parlance*, is where the "bone is out." The operator then rotates the leg by a lateral movement of his thighs, and then directly flexes it by the movement of the hands and thighs together; this movement can only carry flexion to a certain point: as soon as this limit is reached he relinquishes his original grasp, and places his right forearm near the wrist under the knee as a fulcrum, grasps the leg near the ankle with the left hand, and flexes to the full extent. From this description it will be seen that the method originally suggested by Hey for his internal derangement of the knee-joint (often so obscure an accident) is simulated; and, therefore, in such obscure cases success would follow this action and the application of the thumb to the painful point; while in cases where adhesions had existed, the active flexion and "twist" of the joint would at hap-hazard break through those that had impeded its motion, and thus liberate a limb which had long given inconvenience and concern.

The knee being now straight—in the case I have detailed—I laid it in a well-prepared splint, having padded the joint round with wadding, I gave an opiate that afternoon, and let the child gradually recover, as already detailed, with perfect results.

In this instance I did not use passive movements to obtain a very movable joint, as, from the long standing of the disease, I did not anticipate much immediate results as to motion. I put on a lateral support, leaving the motion to be regulated more at the child's will, and by degrees. Every day showed an improvement. But were the adhesions more recent, I would, after a few days, have used gentle passive motion, by swinging the limb, or otherwise. As inflammation might be more apprehended in such recent cases, it may be well to keep pounded ice or evaporating lotions round the joint, and use every reasonable precaution against inflammatory action being set up. The small amount of pain that was experienced after the extension of a joint so long tied together was in the case detailed and in other similar instances remarkably little, so much so indeed that we might almost believe in the assertions that persons who submitted themselves to the operation as cripples walked to their homes.

The amount of extension to be used, it will be observed, was such as sufficed to straighten the limb. I felt, as I have stated, the adhesions give way freely—first, on increased flexion, and

then on extension being made carefully, and with more or less a series of quasi jerking motion than of a violent snap. If the joint is to be straightened at all, it had best be done thoroughly, and have the adhesion fully disrupted; half doing so, or fiddling with it, tends but to irritate and set up renewed inflammatory action. It is best to have these adhesions torn, not stretched, which would only enable them by-and-by to re-establish the inconvenience it is sought to annihilate. This, indeed, seems to be in a great measure the advantage of the "bone-setter," who, being professionally irresponsible, and ignorant of the dangers of joint disease, does not hesitate to rupture fully any obstructions to motion. Mr. Hood remarks on this subject:—"The chief thing necessary is to have confidence, and to exert sharply and instantaneously the full leverage given by the limb. If the operator attempts to move slowly, he will probably in many cases stop short of doing good, *i.e.*, of rupturing the adhesions. A timid operator may easily do mischief by traction upon joints, which after all he fails to relieve, when a bolder and more rapid movement would at once have set the patient free. I am disposed to think that much of the fear of articular inflammation entertained by surgeons is based, if upon clinical facts at all, almost entirely upon the results of motion of an inefficient kind sufficient to increase the hurtful traction of an adhesion, but insufficient for its destruction." The remark made on these occasions when an adhesion is broken through, "Did you hear that?" fully explains the practice. The result is a matter for observation.

Another very successful case will form a good illustration of the advantages of this method of treatment:—E. B., a girl now aged sixteen, when but a child of five years, first suffered from symptoms of "white swelling" of the knee; it eventually suppurated, and after a long contest with the disease, during which amputation was suggested on more than one occasion, the limb recovered in a state of ankylosis. Even a preposterously increased cork sole was inefficient. There was now eleven and a half inches of space between the toes and the ground when the girl stood up, and even with her crutch and the immense sole to the boot she could not walk.

For eleven years this girl had suffered from this bent knee. Her form was becoming disfigured, and her health impaired. On examination I found that a certain amount of flexion remained, but that extension was impossible. I put her under the influence of ether and tenotomised the inner hamstring, and immediately closed the slight wound made. I could find that one great obstacle was at once overcome; then by the aid of an assistant and my own effort, whilst grasping around the

joint firmly, as I have represented already, I extended the limb, and felt very firm adhesions break down within the joint. I thus could bring the limb all but straight. I then laid it in a comfortably-prepared splint, and bandaged from the foot upwards. In eight days, not being quite satisfied with the appearance, I again etherised her, and by force straightened and broke down some adhesions which still remained, and again replaced the limb. The adjustment was not disturbed for six days, and in three weeks she was walking about, resting on the sole of the foot. She has been going about the house up and down stairs, and now (in October), can walk as well almost as ever, though she prefers wearing slight supports to the joint, consisting simply of two lateral iron rods fitting into sockets at the sole of the boot, with a leather support over the point of the knee. The joint has recovered a wonderful amount of motion, and the support is not really required, but she prefers it, as giving confidence while walking.

Here again the most satisfactory results were obtained. A member which had been useless for eleven years was made in a few weeks nearly as perfect as ever—without bloodshed, long confinement, or the use even of complicated apparatus, the crutch and preposterously soled boot being kept now as cherished curiosities only.

In June, 1873, a country girl, aged seventeen, was sent up to Mercer's Hospital for treatment, suffering from a bent knee for six years, the result of similar disease. No abscesses had formed in her case, but the joint was firmly fixed at nearly a right angle, and she could not put her foot to the ground, a crutch being essential to her. As her existence depended on her exertions, she was most anxious that something should be done to regain the use of her limb. I found the inner hamstring very resisting. On June 12, 1873, she was put under the influence of ether, the hamstring tenotomised, and extension was made as in other cases I have detailed. The adhesions were felt and heard giving way "crack, crack," and the limb was straightened at once, then laid on a splint, and in three weeks the girl was walking fearlessly along. She left hospital on July 9, 1873, and shortly afterwards wrote up, expressing her gratification, and saying that she was able to go about without inconvenience, beyond slight stiffness, and without a stick or crutch.

On October 21st, 1874, I extended the joint of a girl, aged nearly sixteen, who had not put her foot to the ground for eight years, but constantly used a crutch. She had first suffered when between six and seven years of age from white swelling of the knee-joint. Very firm adhesions had formed, as indicated by the feel, and by the fact that while extension was

almost lost, flexion was also extremely limited, and the tension of the hamstrings had little or no influence on the deformity: as the girl had grown rapidly during the long period of inutility of the limb, the leg had wasted, and its nutrition suffered so far that it was smaller and shorter, from the head of the tibia to the sole, than the opposite leg, by nearly two inches, while the angle formed was, as shown by the tracing, very considerable. The patella was evidently bound to the condyles of the femur, while, however, a certain amount of "spring" existed between the femur and tibia. The latter had also yielded backwards from the femur. I believed that if bony ankylosis had formed it was between the patella and femur alone. I could not expect in this case, as the leg was smaller and shorter than its fellow, so good a result as in the preceding cases.

On October 21st, 1874, I put the patient under ether, and getting one assistant to extend the leg, and another the thigh, I myself grasped round the knee-joint. I found, as extension proceeded, that the semitendinosus became an opponent. I divided it with the tenotome, and closed over the wound with plaster, and I then made powerful traction from behind forwards against the head of the tibia, which from its having already gone backwards from the femoral condyles, I carefully guarded from further dislocation. I rested the patella against my chest; after a moment or two the adhesions were felt giving way freely, and the limb was straightened as far as the altered position of the tibia allowed. A gutta-percha splint was laid on the back, and bandaging put on from below upwards. Cold lotions were applied to the joint in the succeeding twenty-four hours, fearing any inflammatory action after the disruption of such long-existing extensive adhesions. No inconvenience followed.

In this instance I do not anticipate that mobility to any great extent can return to the joint, and the straight position only can be maintained, and will leave about one and a half inches of shortening, which can be replaced by a thickened sole. I saw this girl stand with her foot laid flat down in six days after my operation of extension.

But in younger patients, as Mr. Barwell remarks, "the epiphysis of the tibia, which has not united, may be broken through and the leg brought into the same line as the thigh, the upper end of the diaphyses will then rest against the edge of the epiphyseal end, and the limb will be only shortened by little more than an inch." (In Fig. 5 will be seen the mode of drawing on the dislocated epiphysis should occasion arise.) In all cases the ultimate object to be gained should be predetermined by the operator. Should it be found that fibrous bands

alone, which yield with tolerable ease, constitute the obstruction, then, after their disruption, motion, to a greater or less extent, should be sought to be obtained, and often in the smaller joints will be restored to an incredible amount. On the other hand, if the union be found to be dense and resisting, and to have resulted from a long-continued form of disease, the patient and surgeon may be fairly satisfied with a more limited area of motion, or even with a stiff joint brought, however, into so favourable a position that it will convert a useless and inconvenient appendage into a limb capable of supporting the weight of the body and of being used satisfactorily in progression. In cases where extensive disruption has been established, it may be judicious to put the limb in a gutta-percha or other splint which had been *previously* moulded to the distorted joint, and to apply cold lotions or pounded ice should any inflammatory action ensue, and after a few days to lay the limb in the more extended posture, using passive motion from day to day. I think patients will, however, regulate the amount of motion for themselves, if a lateral support, with a band across the joint, be supplied them for a short time. No definite rule can, however, apply to each case; discretion and experience must guide the way.—*Medical Press and Circular*, Dec. 2, 1874, p. 478.

36.—ON REDUCTION OF DISLOCATIONS.

By JAMES SPENCE, Esq., F.R.S.E., Surgeon in Ordinary to the Queen in Scotland, Professor of Surgery in the University of Edinburgh.

The manual method of reducing dislocations of the hip has been revived and used with great success; so much so, that the reduction of these luxations, which formerly entailed much trouble and the expenditure of great force, can now be effected in recent cases as if by magic. I have said that the use of the rotatory or circumduction method has been revised: perhaps I should rather have said revived as a general practice, for, in truth, it has never really been altogether abandoned. We generally hear it spoken of as the American method, and undoubtedly it is to the writings of Drs. Reid and Bigelow of the United States that we owe the more general use of the practice in this country; but it is not a little curious that it has been so little known or used, seeing that it is mentioned and described in some of the principal French works on surgery—not old black-letter, but modern books, in the possession of most of us. Thus in Nélaton's "*Pathologie Chirurgicale*," published in 1847-48, there is the following

statement in reference to dislocations of the hip. "In 1835, M. Desprès made known a method which cannot be too highly recommended on account of its simplicity and the real services which it has rendered in certain difficult cases. . . . This method consists in flexing the leg on the thigh, the thigh on the pelvis, to exaggerate even the movement of flexion and adduction of the limb, then to exercise with it a gentle movement of rotation outwards, whilst at the same time it is abducted." This method, says Nélaton, is described by Pouteau in his "*Mélanges de Chirurgie*." M. Chassaignac, in the second volume of his "*Opérations Chirurgicales*," 1862, speaks of this method of reducing dislocations of the hip, and quotes the text of Pouteau as follows. "Surgeon-Major Maisonneuve, of the regiment of Maugiron, a man of great merit, and trustworthy, assures me that he has reduced such luxations without the assistance of any extension. He first flexes the thigh at a right angle with the body; he then executes with the thigh a movement of rotation, which makes it approach the belly as nearly as possible, then carries it out towards the haunch, and returns it immediately by drawing it down towards the sound thigh." Pouteau adds that this method was known to the ancients, and that it is mentioned by Hippocrates and Paulus Ægineta. The diagram I point to is an enlarged copy of an illustration from a French work on "*Bandaging and Surgical Appliances*," by Dr. Goffrés published at Paris in 1859, and shows the surgeon in the act of using the manual method of Desprès. For this I am indebted to my friend Dr. Paterson, formerly of Bahia. M. Chassaignac enters very fully on the principle of the method; and there is a curious sort of coincidence in terms between his use of the letter Y, to assist his description, and the use made of the same letter by Dr. Bigelow, to mean a totally different thing. Dr. Bigelow speaks of the Y-ligament as playing an important part in the rotatory method, describing the ilio-femoral ligament under that name, on account of the divergence of its fibres at their attachment to the femur. Chassaignac describes the leg and thigh, when bent, as representing a pair of compasses opened at a right angle, the lower or horizontal branch represented by the leg, the upper or perpendicular branch by the thigh—this latter divided at its upper extremity into two parts, like the letter Y, one part being fixed, represented by the ilio-femoral ligament, the other movable, represented by the head and neck of the femur,—and then proceeds to demonstrate how, by using the leg as the arm of a bent lever, whilst the ligament, being fixed, forms a pivot—the movable part—the head of the femur is forced or directed to the acetabulum. Here we have an example of

advance by the attention of the profession being directed to a method which had been practised from an early period, and which has never been altogether obsolete.—*Medical Times and Gazette*, Aug. 21, 1875, p. 208.

37.—ON SUBPERIOSTEAL SURGERY.

By JAMES SPENCE, Esq., F.R.S.E., Surgeon in Ordinary to the Queen in Scotland.

In excisions of joints, I think the subperiosteal method must be used with discrimination. In cases where, as in the lower extremity, a firm solid support, and not a movable joint, is desired, its value is at once evident; and perhaps in some excisions of the upper extremity, in which we require to remove a very large amount of bone. In ordinary excisions of the upper extremity, we are more troubled with redundancy than deficiency, and generally require to remove a considerable amount of bone to prevent ankylosis from occurring; but in truth, in a great many cases, the question is settled for us by the disorganised state of parts on which we operate.

There is one class of cases in which subperiosteal surgery seems likely to achieve some brilliant successes: I mean cases of acute necrosis, as they are called; in other words, cases in which inflammation of the dense shaft of a long bone has been so rapid, general, and violent, that nutritive changes seem arrested; and the bone separated, or nearly separated, from the investing periosteum, is exposed, with its surface bare, smooth, and white, as if dead. Although in such cases the constitutional disturbance, at first from irritative fever, and subsequently from hectic, always places the patient's life in great jeopardy, and though the tendency of the local action to spread to the epiphyses and involve neighbouring joints is very great, we have hitherto been content to wait patiently, often most anxiously, for nature to separate between the dead and living bone, before interfering. In cases where the state of the patient seemed to point to amputation as the only chance for life, the results have been so unsuccessful, that I think it scarcely warrantable. Now, however, by separating any remaining connexion of the periosteum, and resecting and removing the diseased portion of the shaft, the long process of separation is avoided; the constitution is saved the tax on its powers from discharge, irritation, and hectic; the periosteum which is left furnishes new bone to take the place of that removed by the surgeon; and the limb gradually assumes its normal form and usefulness. Here it would seem, we have clear advance in the treatment of disease; and I

believe it is a real and great progress. Still, we must look at it carefully, from different points of view, so as to make sure of this, and avoid the method suffering from being practised indiscriminately, or in improper cases, or during unfavourable conditions. We must remember that, in what we call acute necrosis, the loss of vitality seldom extends to the whole thickness of any great length of the bone; that, whilst the periosteal sources of nutrition may be largely or entirely cut off, the vascular supply and nutrition of the medullary canal and the ossific centres may not be, and rarely are so, to the same extent; and hence we can never be sure for some time how much of the affected bone may really perish, whether there may be a large portion to separate ultimately, or merely superficial exfoliations; or, as I have known, the whole surface of a long bone like the tibia may be exposed bare and white, and yet granulate and heal without a vestige of exfoliation occurring.

But, whilst I think it right that these things should be kept in mind, lest we interfere ultroneously and remove texture which natural processes would have saved; on the other hand, looking at the matter practically, when we see a patient suffering from hectic or occasional hemorrhage from ulceration of vessels near the diseased bone, and when we consider how long he must be exposed to such sources of debility before the dead bone separates, and the risk of the implication of neighbouring joints occurring and necessitating amputation, I am shut up to the conclusion that resection and removal of the affected bone must be often indicated; and that, if the cases for its performance be judiciously selected, and the operation be properly effected, this method will be found to be a most valuable addition to our resources.

The important question, no doubt, arises, How far can we trust to the reproduction of new or substitute-bone from the periosteum, when the whole thickness and nearly the whole length of a long bone like the tibia has been removed by operation? And this question not unnaturally suggests itself, because we know from experience that under the expectant plan, when large and long sequestra were removed, the thickness of the shaft was never renewed to its full extent, although under that method we had both bone and periosteum to furnish new material. Here, for example, is a specimen, showing a large sequestrum removed when loosened by Nature, and a cast of the leg showing the appearance of the limb after the cure was completed.

During last winter, Dr. McDougall, of Galashiels, now of Carlisle, exhibited a child to the Medico-Chirurgical Society of Edinburgh, in whom he had resected the tibia in

a case of acute necrosis, and the thorough reproduction was well seen, and the use of the limb was perfect. In April last I operated on a similar case, and resected the shaft of the tibia close to the epiphysis at each end, after separating the periosteum. Here is the portion removed; and as the case is still in hospital, the members of the Association can judge of the probable result, so that I think we may trust to the periosteum for entire reproduction of the part removed. To these and similar successful cases it may be objected that in cases of compound fractures, when the broken bone protruded, divested of periosteum, resection of the denuded bone was and is frequently practised; but experience has shown in such cases that when the portion of bone so removed is large, reunion is almost never perfect; the ends of bone are atrophied and joined together by a tough fibrous material; or, in the case where there are two bones, as in the leg and forearm, the ends of the resected bone approximate and unite with the other bone. A little consideration, however, will show that there is really no parity between such cases and resection for acute necrosis, because in the case of compound fracture the periosteum is not merely separated, but is generally so torn and bruised that its vitality is destroyed, or so impaired that its reproductive powers are rendered very imperfect; whereas in necrosis its vascularity is increased, the membrane thick and flesh-like, and it almost invariably carries with it small nuclear portions of bone-tissue.—*Medical Times and Gazette*, Aug. 21, 1875, p. 207.

38.—THE TREATMENT OF FISTULOUS SINUSES BY MEANS OF THE ELASTIC LIGATURE.

By W. ALLINGHAM, Esq., Surgeon to St. Mark's Hospital, &c., Dublin.

In February of 1873, Prof. Dittel, of Vienna, made a communication to the Imperial Medical Society of that city on the advantages of the india-rubber ligature over other means in the treatment by operation of several surgical affections. At that time Prof. Dittel thought he was the originator of the method he described and advocated, but subsequently he discovered, or was informed, that Dr. Grandesso Silvestri, of Vicenza, had proposed a similar procedure, and even carried out some operations in the year 1862, or more than ten years prior to Prof. Dittel.

It also appears that a much honoured Fellow of this Society, Mr. Henry Lee, had read a paper in the year 1870, at the Medico-Chirurgical Society, on the use of an elastic ligature in the removal of nævi, and further, that at the same meeting,

Mr. Holthouse claimed priority for himself, having, he said, employed the elastic ligature in cases of fistula in ano, and for the division of bridges of skin between fistulous orifices. Admitting, therefore, as Prof. Dittel immediately and most readily did, when the facts were brought to his cognisance, that he was not the originator, still, whatever credit may be due to the method must really be ascribed to Prof. Dittel, as the man who, by a series of experimental operations, showed what really could be accomplished by the ligature; in fact, he has done what had evidently never even been dreamed of by those gentlemen who employed it before him.

After reading myself Prof. Dittel's paper, I came to the conclusion that, assuming his statement of facts to be worthy of credence—and there was every reason to believe them to be so—we might find in the india-rubber ligature a valuable addition to our usual modes of operating, and very importantly so in that branch of surgery to which I had paid especial attention. I was perfectly willing to make every allowance for the enthusiasm of the originator of any novel proceeding, and did not expect wonderful results from the ligature; most certainly I did not imagine for a moment that it would ever supersede the knife in the vast majority of cases, although I thought it might replace it with advantage under some special conditions. I was also perfectly aware that the objection that the method was unscientific might be advanced against it, and also that it essentially lacked the brilliancy pertaining to operations by the knife; but looking rather on the practice of surgery as an art than as a science, and considering that the first and great object of a surgeon's life should be to cure, and further that he should try to cure as quickly, pleasantly, and as safely as possible, I determined to fairly test the elastic ligature in what I thought suitable cases, feeling my way to more important attempts should I find encouragement to do so. Most of you, I dare say, well know how accidentally Prof. Dittel discovered in what a facile way a thin india-rubber cord could cut into dense tissues, even solid bone, and that in the elastic nature of the ligature resides its peculiar power.

Ligatures of thread for a great many years, even, we may say, from the time of Ambrose Paré, have been employed for cutting through certain structures, mainly arteries; but hemorrhoids, nævi, warty and pedunculated growths have constantly been removed by the application of a ligature, and the reason it has not been more extensively available has arisen from the fact that only a comparatively limited thickness of tissue can be cut through by *one* application of the ligature, which, as suppuration takes place, becomes loose, and then does not penetrate further unless it be retightened; it is only therefore

small and soft growths that can be safely and advantageously treated by the thread ligature.

Various means have been devised to overcome this inherent defect, and make the thread ligature cut, by constantly or frequently tightening the thread — such means are shown in Ricord's instrument for the treatment of varicocele; Mr. Luke's double screw, which he invented for cutting through rectal fistulæ which ran so high up the bowel as to be considered dangerous of division with the knife. A variety of methods, of which a spiral spring is the essential, have also been employed, from the using of a wooden spiral-spring letter-clip up to the very ingenious sarcotome of Dr. Ainslie Hollis.

To all these methods, comparatively good as they may be, some very strong objections may be raised. From considerable experience, I know that Mr. Luke's double screw, valuable as it has proved, causes very intense pain; the daily or frequent necessity for tightening the ligature inflicts upon the patient a torture often unendurable, and on many occasions the knife has had to complete what the ligature began, the patient being unable to endure the long-continued suffering. Another very grave objection to the intermitting application of pressure is the frequency with which secondary abscesses result. I have had this not uncommonly occur in my own practice, and seen it also in that of other surgeons.

Dr. Hollis's ingenious sarcotome is very superior to the others in its action, but even this requires tightening or re-setting from time to time; it acts also only in one direction, and therein lacks the even *circular* pressure exerted by the india-rubber. Another important objection is its size and weight, which render it, under many conditions, inapplicable; and lastly, its expense is very considerable, and you would require quite a stock of them if you wanted to use the instrument frequently.

It must be evident, on reflection, that the pressure of the india-rubber band or loop is not always the same during all the progress of the cutting: in fact, it diminishes gradually as the loop of the ligature becomes less in circumference: but practically, the pressure up to the moment of separation, if properly adjusted at first, is sufficient for its work.

The utmost pressure exerted by a solid india-rubber ligature of the thickness of $\frac{1}{10}$ th of an inch, stretched to the utmost, only equals $2\frac{1}{4}$ lbs. weight; for example, 6 inches of india-rubber, when stretched to its utmost, *i.e.*, 3 feet, exercises a power of $2\frac{1}{4}$ lbs.; when stretched to 2 feet, only a little more than $1\frac{1}{4}$ lbs.; and when stretched only 1 foot, or double its length, $\frac{1}{2}$ lb.; and even this power is quite sufficient, as shown by experiment, to pass through any ordinary tissue, in conse-

quence of its unremitting and even pressure in every direction. In my experience, now, I do not think it necessary, or even desirable, in ordinary tissues, to fix the ligature so tightly around the part to be severed as I formerly did. I believe a slighter equable pressure will effect safely and more painlessly all we require. In fact, the elastic ligature does not so much cut as gradually compress and render dense the part contained within the loop, and this is how its action differs from inelastic ligatures—ulceration taking place on both sides of the loop, so that when the ligature comes away, actually a portion of the tissue is found contained in it; so hard, dense, and semi-transparent is this as to resemble horn.

In my earlier operations I used a small drainage-tube, tied in a reef knot, as recommended by Prof. Dittel; this does not answer so well as the solid india-rubber used by Sir Henry Thompson, and I never now tie a knot, as the knotting very easily breaks the india-rubber; but I adopt a plan I will presently describe. In my early cases, when employing the drainage-tubing, I twice had to tighten the ligature, as I thought it was not exercising sufficient pressure; but I now know this need scarcely ever be done if the ligature be properly adjusted at first.

I am myself thoroughly convinced that there are decided advantages in the india-rubber ligature over the knife in many surgical cases: it is my intention to-night to confine my remarks specially to the subject of its use in sinuses; but I may mention that I have an experience of the ligature in sixty operations, the characters of which I will only mention—viz., twenty-eight cases of fistula in ano at St. Mark's Hospital, and twelve in private practice; five cases of hemorrhoids; two cases of sinuses in the groin, one in the neck; two removals of scirrhus breasts; two cases of pedunculated tumours (one case of my own, the other Mr. Shillitoe's, who applied the ligature at my recommendation, and with my assistance, and with excellent result); two cases of varicocele; two of varicose veins; one division of the sphincter ani muscles, in case of great tendency to hemorrhage; two cases of linear rectotomy; one naevus. In none of my cases has there been any serious "contre-temps." I have only once seen a secondary abscess follow the ligature. I have never had a case of erysipelas, and the resulting wounds have been uniformly remarkably healthy. Many of my cases at St. Mark's Hospital were treated when the hospital was by no means in a good hygienic condition; but all my ligature wounds went on well, and generally were much healthier than the wounds in patients in adjoining beds that had been made with the knife. I frequently showed to gentlemen who accompanied me round the wards my cases of ligature

doing perfectly well, and my incision cases very much the reverse, although precisely the same after-treatment had been adopted in each—viz., the application of carbolised oil. Our resident surgeon, who of course had the opportunity of watching the cases day by day throughout the treatment, often commented on how much better the ligature cases did than the others. Here I must mention that I did unfavourable as well as favourable cases with the ligature (three of my twenty-eight hospital patients were decidedly phthisical), and when occasion presented, I chose two patients whose cases were as much alike as possible, the patients being also nearly of an age, both healthy-looking, and as far as one could judge, both likely to do equally well. The result of this experiment was uniformly in favour of the ligature.

In nineteen ligature cases the average time in the hospital was twenty and a quarter days, while in nineteen selected incision cases (selected to exclude very bad ones), the average time was thirty-five days.

Broadly one may state these probable advantages of the ligature over the knife in dealing with sinuses of an ordinary character :—

1. The operation is commonly painless, and the subsequent suffering, if any, is usually very slight.

2. It is bloodless.

3. There is greater rapidity of cure.

4. The patient need not keep his bed, nor even his room, but may go into the air, driving or walking in moderation.

5. Its peculiar applicability to delicate patients, and those who have a phthisical tendency.

6. There is usually no anæsthetic required.

7. There is a minimum amount of suppuration.

8. And one may add that the ligature is often very advantageous as a supplement to the knife.

I shall make a few observations on each of these points, and relate some illustrative cases.

The operation, if it may be called so, is really painless, *i.e.*, no more pain is inflicted than that which is caused by the passage of a probe through a sinus, and this, performed skilfully and gently, ought to give no pain, unless the sinus be inflamed. Should the fistula be an incomplete one, a slight amount of pain may be experienced in rendering it complete. The tightening of the ligature patients never flinch at or complain of.

The pain after the operation is usually very slight. Many of my patients said there was really no suffering, and they slept soundly the first night. Others were disturbed at times during the night after the operation, but afterwards were free of pain ;

others, delicate, excitable people, complained for some two or three days: but persons behave so differently under pain that it is very difficult to speak positively on this point. The best proof that the pain is but slight may be deduced from the fact that several of my patients have gone about their business, and not laid up more than a day; for example, a gentleman in a bank had three sinuses in his left groin, the result of suppurating buboes of long standing; one sinus passed round the thigh towards the perineum; the length of it was $3\frac{1}{2}$ inches. I put an elastic ligature through it one Saturday afternoon; he had pain in the night, and more or less on Sunday; but on Monday he went to his business, and continued daily to do so. The ligature cut its way out in six days, and the wound looked splendidly healthy. Emboldened by this success, on the following Saturday I put two more ligatures through the other sinuses, and again on Monday he went to his office—in fact, he only kept his house on the two Saturdays and Sundays, and in thirty-seven days he was perfectly well. A case of fistula in ano was treated by me in the same way under more unfavourable circumstances. A warehouseman, æt. 27, a delicate-looking man, had the ligature introduced on one Saturday. He went to work on Monday, and was occupied almost all day in standing and walking about, but without any further rest, except the Sundays; he was thoroughly cured in eighteen days.

My opinion is, founded on a fair number of cases, that absolute rest in bed, or confinement to the room or house, is by no means a necessity. Of course, I do not advocate much walking about or hard work, and, on theoretical as well as practical grounds, I should advise any patient who can spare the time, or whose case is severe, to take all the rest and quiet he could, in the hope of hastening the cure, and preventing any accidental interference with the healing process, and also mitigating possible pain.

The operation is almost, and on some occasions quite, a bloodless one. This, of course, is of no moment whatever in simple cases, where the amount of blood lost in the use of the knife is next to none; but when fistulous sinuses run very far up the bowel, and the parts are at the same time, as they frequently are, both vascular and indurated, it is an advantage not to be lightly valued. I have with the elastic ligature laid open the rectum for six inches upwards in a case of stricture and ulceration, where, from the induration and vascularity of the parts, very profuse bleeding would have inevitably followed the knife, and not a teaspoonful of blood was lost. Again, in cases of hemorrhagic tendency this method is highly useful, and it helped me out of a case which I think is quite worth shortly narrating to you.

An American gentleman was sent to me early this year by Dr. David Young, of Florence. He had long suffered from an ulcer of the rectum within the sphincter, and he had been under the care of many surgeons, American and Continental, without obtaining any permanent benefit. The usual symptoms were present in this patient, but an important feature was that for years he had frequently lost large quantities of blood from the bowel, which the ulcer did not seem quite to account for, although vascular. I made sure that the bleeding came from the rectum, and not from high up the bowel, and also that he had no hemorrhoids; but upon this point I need not dilate. When he consulted me I found, in addition to the ulcer, a small fibrous polypoid growth close to the upper edge of the ulcer, and, as I thought this might be a source of irritation and keep up the sore, I removed it, placing a ligature upon it; but the small pedicle cut through on drawing the ligature tight. On this accident occurring I carefully examined the part with a speculum, fearing hemorrhage; but, as none took place, I contented myself with placing a little styptic wool in the bowel. No doubt, as soon as the slight shock caused by his trepidation passed away, and his circulation rallied, the bleeding commenced *slowly*, for the vessel must have been very minute. The history of the hemorrhage was as follows: He dined and went to bed early, and fell asleep. After two hours he awoke, feeling very faint and sick. He took some brandy and water, felt better and again dozed off. After a time he awoke again, was faint, and felt desirous of going to the stool. This he did, and, to his great alarm, nearly filled the chamber utensil with bright red blood. He then fainted off, and was got back into bed. In my absence a neighbouring practitioner (Dr. Spurgin) was sent for, and he arrested the bleeding by means of ice. It recurred, however, the next day, and I finally stopped it with the persulphate of iron. The blood was easily retained in great quantity in this case, because the patient had a very hypertrophied and tightly contracted sphincter ani, and also a much dilated rectum, the result of the habitual use of copious enemata.

On questioning my patient, he informed me that he always bled very much on the least cut or prick, and had great difficulty in restraining the hemorrhage. In appearance this gentleman was remarkably fair, freckled, and thin-skinned. After the removal of the polypus the ulcer still defied all treatment, and I became certain that it was absolutely necessary to do what I had at first advised—but the advice had not been accepted—viz., to divide the sphincter; but then came the question of bleeding, and I confess I was somewhat doubtful as to the result, when,

in a moment, the elastic ligature presented itself to my mind as a solution of the difficulty.

Aided by my colleague, Mr. Alfred Cooper, Mr. Clover giving nitrous oxide and ether, I passed a double elastic india-rubber ligature under both sphincters, and tightly secured one ligature and left the other loose. I passed a double ligature, and left one loose, in order that the small wound made by my instrument might be thoroughly plugged up by the india-rubber. The operation was perfectly successful; really not a drop of blood was lost: the ligature cut through in nine days, and in thirty days he was cured, and returned to America perfectly well. He did not keep his bed, except the day of the operation, and did not at all complain of the pain, nor did he require any opiate.—*Medical Press and Circular*, December 2, 1874, p. 480.

39.—ON BLOODLESS SURGERY.

By Professor JAMES SPENCE, Surgeon in Ordinary to the Queen in Scotland.

It is in connexion with operations for necrosis and the excisions of bones and joints that what is termed "Esmarch's bloodless method" of operating is seen to the greatest advantage, and these subjects suggest to me the consideration of that and other methods of "bloodless surgery." The bloodless methods may be divided into two kinds. First, those that have for their object the prevention of loss of blood during the progress of operation; and, second, those by which the surgeon is enabled to divide textures by means of apparatus which, by the very mode of division, prevent the escape of blood at the time, and also act as permanent hæmostatics.

The method of Esmarch, though another example of great improvement in carrying out a principle, can only be looked upon as a revival, not as new. The principle was clearly enunciated by the late Sir Charles Bell; and the mode of carrying it out by bandaging the limb from below, and then rapidly screwing tight the tourniquet, is described when discussing the value of the tourniquet in amputations, in his "Great Operations of Surgery." But it is not in amputation that the method is most useful or seen to most advantage; and hence it had generally fallen into disuse. The method of Esmarch, by using the indiarubber roller to expel the blood from the part of the limb to be operated on, and the strong indiarubber tubing to constrict the limb and act as compressor, effects the object in view perfectly, and hence enables us to see the parts on which we operate as in a dissection, and prevents

all loss of blood during the operation. It is a most valuable assistance to us in such operations as those for necrosis and resections of bones and excisions of joints. In many cases of removal of large sequestra, or resections of the shaft of a bone especially, we can, by stuffing the wound with oiled lint, and applying a compress and bandaging the limb before removing the circular compressor, render the operation absolutely bloodless. In excision of joints where we require to tie arteries after the operation, I prefer the tourniquet to the indiarubber as a circular compressor. It is equally effective in restraining bleeding; and, by loosening or tightening the screw, the vessels can be secured with less loss of blood than when the indiarubber is employed. Indeed, in many amputations, whilst the incisions are completed bloodlessly by Esmarch's method, the sudden and general oozing from the cut surfaces which follows relaxation of the indiarubber entails more loss of blood eventually than when the tourniquet alone is used. I have repeatedly amputated at the thigh and at the hip-joint, using only the tourniquet or manual compression, with the loss of not more than three or four ounces of blood; and in one case of primary amputation of the hip in the country by candlelight, in which I had the blood carefully collected from the tiled floor, as there seemed to be a large clot, I found, to my astonishment, that it barely amounted to half a teacupful. In many cases of amputation, owing to the septic state of the tissues or the malignant nature of the disease for which we are operating, I consider it inadvisable to repress the blood and other fluids—such as unhealthy pus or cancer juices—into the parts above. In such cases, I draw a band of indiarubber tubing, pressing on the limb from above downwards, and tighten it immediately above the part to be removed. This, of course, saves no blood to the patient; but it renders the operation bloodless in another sense, and is especially useful in private practice, as avoiding soiling of the floor or furniture. In cases of excisions of joints, where the parts are loaded with pus, I constrict above and below the point to be operated on, and thus secure a nearly bloodless operation without risk of repressing the unhealthy fluids into the textures higher up. I cannot see the advantage of the Esmarch method in such operations as ligature of the femoral artery. I have had frequent occasion to perform operations of that kind, and also of seeing them performed by others; but it is rare to see any bleeding; and I think it better that the artery and vein should be left in their natural condition, that the operator may see and deal with them. An empty and collapsed vein would, I think, run greater risk of being injured than when seen full in its natural relation to the artery. I make these exceptions

because I think that this form of bloodless surgery is liable to suffer from its indiscriminate use, and from over-laudation; but I have already said that I consider it a most valuable aid in proper cases, and it seems as if it were revived now with special relation to the progress of conservative energy.

The bloodless surgery comprised under the second head consists, as I indicated, in division of parts by means of the various apparatus which prevent bleeding during the process, and permanently. It includes cauterising agents, whether red-hot knives or galvano-cauterics, and crushing divisors. such as the different kinds of *écraseurs*. In regard to the cautery to stop hemorrhage, I need hardly say we cannot claim that as new, or as a discovery of the present time. Indeed, I referred to this as one cause that might lead an observer to suppose that we were revolving back to primitive surgery. Before the general use of the ligature, no small ingenuity was used to invent instruments which would sear and arrest bleeding as they cut the textures; and some surgeons, when they ventured to cut through living textures, used the summary method of applying hot pitch or tar over the face of the stump, to arrest the bleeding. I am old enough to recollect seeing the result of an amputation of the thigh which had been thus treated. The man had been injured on board a whaling vessel; and for lack of other aid the ship's carpenter amputated. Whether from his acquaintance with ancient surgical authorities, or simply acting on the rules of his craft, he "paid" the stump with hot pitch. The man recovered well, possibly owing to the antiseptic action of the pitch, and subsequently eked out his means of living by exhibiting himself at the surgical classes as an "Ancient Mariner" and a connecting link with antique surgery. Although heated knives are again being used, I cannot and I do not think the profession will hail their revival as a mark of progress in surgery. But, in regard to the use of the galvano-cautery for the purpose of dividing very vascular textures, or for removing tumours in situations where we cannot reach and tie divided vessels, or where there is danger from the blood entering the air-passages during an operation, as in some operations on the mouth, I think there can be but one opinion of the value of such means, and also that modern surgery has made advances, and I trust is destined to make further advances, in this direction. The chief difficulties to be overcome are in the cumbrous nature of the apparatus and the difficulty of getting a galvanic power in moderate compass to heat a platinum wire of sufficient thickness. In the surgical manipulations, habit of using the wire requires to be attained to keep it in constant and close contact with the tissue to be

divided, because at any point where the wire does not touch and give off its heat to the tissue, it fuses and gives way under the action of the electric current. Those of us who have been accustomed to use the knife will find it advantageous to acquire the mode of manipulation necessary for proper use of the wire. From the very few opportunities I have had of seeing or using the galvano-cautery, I am hardly warranted in expressing an opinion; but I think we require to modify the heat so as to divide the parts more slowly, because a large vessel cut across rapidly by a wire at a white heat will bleed at once as if cut by a knife. The *écraseur* is another means by which bloodless severance of textures can be effected, and it has even been employed for the amputation of limbs. Its real value, like that of the galvano-cautery, lies in its application to operations where the parts to be divided are so situated that we cannot tie the vessels or command bleeding during section of the parts. Its utility in such cases, more especially in operations on the uterus and tongue, has been longer and more largely tested than galvanic cauterisation, and as compared with our present means of applying the last-named method, it is more simple and more easily managed; but it seems to me that, from the nature of the wound left after use of the *écraseur*, it is more liable to unhealthy action than that resulting from the cautery; and, if that method could be rendered more manageable, I believe it would gradually supersede the *écraseur*.

Meanwhile, however, the *écraseur* is an instrument of great value for the class of cases I have alluded to, and forms another addition to the resources of our art.—*Medical Times and Gazette*, Aug. 24, 1875, p. 208.

40.—ON THE VALUE OF FLUCTUATION AS A SIGN.

By T. H. BARTLEET, Esq.

Fluctuation in surgical affections is a symptom so common, and is in so many cases looked upon as pathognomonic of the presence of fluid, that I have thought it might be interesting to consider its true value.

I suppose it has occurred to most surgeons to have passed a knife into a swelling, feeling assured that fluid would exude, but have felt surprise, perhaps chagrin, at the crucial test they had applied, forcing upon them the conviction of an erroneous diagnosis.

I need hardly describe what fluctuation is; we all know that the sensation is due to the incompressibility of fluid, and its

consequent equal movement in all directions upon the application of pressure. The degree of movement felt depends upon many conditions, such as the limpidity of the fluid, and its quantity, the depth at which it lies, and the compactness of its covering, the thickness, and the compressibility of the sac enclosing it, and also the tension of the fluid in its sac. I need hardly illustrate this, since it is evident that a fluid becoming nearly solid or semi-solid, would evidently not even intimate this sensation as clearly as a limpid fluid, and inasmuch as the depth may vary from that of the thickness of the skin to that of many inches in the human body, and the compactness of the tissues covering it from cutaneous to osseous, it is evident that this symptom fluctuation must present various degrees of distinctness, and that often only the "tactus eruditus" will enable a surgeon to ascribe to a sensation of fluctuation its true value. Various terms have been given by surgeons to describe these differences of sensation, and doughiness and elasticity are often described as varieties of fluctuation, and I think rightly so described, since, in very many cases, a sensation is perceivable by the touch which assures us of the presence of fluid, which sensation is widely different from the undulation or thud, which is the most marked kind of fluctuation, and which is so distinctly perceptible in thin-walled ovarian cysts or in many cases of ascites. I shall not enter into the general considerations of how best to detect fluctuation, viz., by the gentle tap, the gentler the better. I have often myself in large collections best felt it by baring the wrist, placing this, say, on the distended belly, and gently tapping by one finger of the same hand; the impulse is, I think, better felt in this way than by applying the two hands, as usually directed. I may mention also that when fluid is covered by cedematous superficial structures, the pressing out of the fluid in the areolar tissue will frequently enable the fluctuation to be more clearly felt.

I may also allude to the sense of fluctuation which may, and sometimes *can only*, be felt by one finger, as in post-pharyngeal abscess, or in retro-uterine hæmatocele or peri-uterine abscess, where the presence of fluid may be frequently diagnosed with absolute certainty by a pushing or "prodding" action with one finger, but in certain cases we undoubtedly get fluid without being able to detect fluctuation as in hydroceles, where from frequent inflammation the tunica vaginalis has become much thickened, and even in very tense hydroceles, where the coverings are still thin; in some cases also of pus firmly bound down by fascia it is extremely difficult to differentiate between solid and fluid, as in deep mammary abscess. But while, on the one hand, it is often difficult to detect fluid when present, it is, on the other

hand, by no means uncommon for even experienced surgeons to come to the conclusion that fluid *is* present when it is not so. As an example, I may allude to the sense of fluctuation given by the pulpy degeneration of the synovial membrane in white swelling of the knee, and to the prognosis of cysts in breast tumours, where on section none are found to exist. But my clinical note to-day has reference to another cause of false or supposititious fluctuation. Let me relate a case.

A man was under my care for a severe injury to the left knee, and I had associated with me in the case a surgeon of the highest skill and reputation. The leg became gangrenous, and there was considerable oedema of all the tissues of the thigh. My friend insisted that there was deep-seated pus, to which opinion I demurred on strong representation, having always a respect for the opinions of others; on the following day I passed into the most prominent and fluctuating part of the swelling a fine knife, which I always carry in my case, made like a fine tenotomy knife, and which I am accustomed to say will go almost anywhere without injury. I passed this to the bone with no result. My friend still insisted that there was a bag of pus, and that I had missed the sac, so I requested him to try his hand, and he made one or two incisions, with a similar result; at last the man died, and dissection showed the absence of any collection of fluid, although the symptom "fluctuation" had been most marked.

Another case, a woman with a large prominent swelling below the ensiform cartilage, which she said was hydatid cyst, and which had been tapped by a metropolitan hospital surgeon, and fluid drawn out. This patient, too, was seen by many skilful physicians and surgeons who I believe without exception came to the conclusion that there was a bag of fluid of some kind or other.

I passed an aspirator needle, and by that I mean that the aspirator was used as an exhausted needle, the stop-cock connecting the aspirator with the needle being opened, directly the needle had penetrated the skin, thus insuring that on sac existing should not be entirely passed, though, and notwithstanding this, no fluid came. On another occasion I passed a small trochar subsequently connected with the aspirator, the trochar penetrating $1\frac{3}{4}$ inches, while on the former occasion the needle penetrated $2\frac{1}{2}$ inches, and still no fluid came.

Now, there must be some peculiar or ill-understood or ill-recognised condition which led many skilful and careful men into error, and which are constantly leading our students into similar mistakes.

I believe this false fluctuation to be generally due to the combination of two causes of error, one being muscular or

glandular elasticity, and the other being muscular or glandular displacement.

I think any one who tries the experiment will be surprised at the sensation of fluctuation which can be obtained by pressing alternately, as in endeavouring to find the sense of elasticity or fluctuation of an abscess, a muscle across the direction of its fibres, say the biceps, or by similarly manipulating across the direction of the ducts, a firm and fairly large female mamma; either one of these two before-mentioned causes alone might mislead: I mean either the displacement of the gland or muscle or the elasticity of the gland or muscle: but when you get combined the elasticity and the displacement, a supposititious fluctuation is felt so like to the real as to be almost if not quite undistinguishable from it. How, then, are we to be certain, especially in these positions, where either a gland or muscle are liable to mislead us, that the fluctuation we feel is really due to fluid? By a very simple plan, which I have never known to fail, and which is not clearly enunciated to my knowledge in any of our text-books, viz., by practising the manœuvre of palpation, not only across the line of the muscular fibres or of the gland ducts, but also in a direction at right angles to this.

If the fluctuation be fluid it will be equally felt in all directions; if it be due to muscular or glandular elasticity or displacement, or both combined, it will be only felt in one direction, viz., across the muscular fibres or the gland ducts.

Let me mention one more case. I have at present under treatment in the General Hospital a young man with hip disease. There was present a barely recognisable pulsation behind the trochanter, and it was a question whether or no there was fluid. I diagnosed that there was. Now, in this position you have the fibres of the gluteus running obliquely downwards, which will give the sensation of fluctuation, while beneath these you have the gemelli pyriformis tendon and quadratus femoris running from side to side, so that it is necessary to palpate in at least three if not four directions to be quite sure that the fluctuation that is felt is not supposititious. By practising this manœuvre I was able to satisfy myself and to give a positive diagnosis of the presence of fluid, a diagnosis that was confirmed by the use of the aspirator. I would just sum up my conclusions,—that fluctuation of the most distinct kind may be caused either by the elasticity of muscular fibres, or by the displacement of muscle: by the elasticity or displacement of glandular tissue; that this only occurs in one direction, viz., across the fibres of the muscle or the general direction of the gland ducts; that palpation at right angles to this will differentiate the false and the true fluctuation, inas-

much as false fluctuation is felt only in one direction, while true fluctuation is felt equally in all directions; that where different layers of muscles take different directions, care must be taken to palpate at right angles to each layer of muscles.—*British and Foreign Medico-Chirurgical Review*, July 1875, p. 202.

ORGANS OF CIRCULATION.

41.—ON THE SURGICAL TREATMENT OF POPLITEAL ANEURISM.

By TIMOTHY HOLMES, Esq., M.A., Professor of Pathology and Surgery to the Royal College of Surgery.

[In this paper the results of the treatment of popliteal aneurism in the hospitals of Great Britain is considered.]

With regard to the relative success of cases in which ligature is employed after the failure of compression, we have in our hospital table 44 cases in which the femoral artery was tied under these circumstances. Death followed in eight cases: in one from pneumonia and disease of the valves of the heart; in one from disease of the kidneys; in one from aneurism of the aorta; in one from erysipelas and pneumonia; in one from secondary hemorrhage; and in the three other cases after amputation, there being in one of these cases also extensive disease of the heart, from which the patient died, while convalescent from the amputation. But there were also five other unsuccessful cases—viz., four in which amputation was performed with success, and a fifth in which the aneurism was known to have recurred two years after its apparent cure, but nothing is said as to its treatment then.

This makes the total number of cases in which the ligature failed when applied after the unsuccessful trial of pressure 13 out of 44,—a much higher proportion of failure than in those cases where the ligature was used at once; showing in the cases where the ligature was used after the employment of pressure, 29·54 per cent. of failures, as against 19·48 where no pressure was employed. This is contrary to the general belief, which is founded mainly on the statistics collected by Mr. Hutchinson, and published in the *Medical Times and Gazette* for Nov. 29th, 1856. Those statistics were founded on the result of only 76 cases in all, of which 54 were treated by compression; and of these latter 46 were popliteal aneurisms, 24 successfully treated by compression, and 22 in which the compression treatment failed, amputation being had recourse to in 3 cases (and in all successfully); while the femoral was tied in

the other 19, with 5 deaths. These figures differ slightly from Mr. Hutchinson's own tabulation, since he has included in the general total a very few cases in which the femoral was tied for femoral aneurism, whilst I am here speaking of popliteal aneurism only; but the same general observation applies to Mr. Hutchinson's own statement also—namely, that the figures are too small to bear the conclusion which has been based on them. They have been taken to show—and in this respect I must plead guilty along with other authors—that the treatment by compression has a favourable influence on the after-progress of cases generally, by enlarging the collateral circulation, and thus lessening the tendency to gangrene. From this cause it is held that the mortality after the ligature is lessened when it becomes necessary to tie the artery on the failure of compression. My own much larger numbers would show, to anyone who trusts implicitly in figures, that, on the contrary, the mortality of the operation of ligature of the femoral artery in modern practice has proved considerably less than that which was deduced from the records of practice in the last two generations, and that the proportion of deaths in cases which, after having been submitted unsuccessfully to pressure, are treated by ligature of the femoral, is greater than the average mortality of cases treated by ligature at once.

The latter conclusion need not surprise us. It is quite true that the application of pressure will probably enlarge the collateral vessels, and thus diminish the risk of gangrene. But it will also have somewhat exhausted the patient, and it may have produced a certain amount of injury to the vessels at the part compressed; and these disadvantages are to be set against any advantage which may be gained by the enlargement of the collaterals. But what is of far more importance to the general result is the fact—which seems to me certain, though it is very difficult to prove it from the notes of cases—that pressure succeeds in the best cases in which it is tried, and fails in the worst. Hence the mortality is likely from the first to be greater in the cases of failure than in those of success. Allowing this, let us look at the total statistical result of the cases which I have collected.

Of the 77 cases treated by ligature at once, the deaths were 11, and the total number of failures 15; showing a percentage of 14·3 of deaths and 19·48 of failure.

Of the 124 cases in which the treatment by pressure was undertaken, success was obtained at once in 66; in 44 of the others the ligature was applied and succeeded in 31; making the total number of successful cases 97, and the total number of failures 27. Of these 27, however, only 14 died—viz., 1 of an accidental attack of pleurisy, 5 after amputation

with no previous ligature, and 8 after ligature. This makes the percentage of deaths 11·2, and that of failures 21·7. So that the total result of compression treatment, as compared with that of the method of Hunter, has been that the percentage of deaths after compression has been a little less, but that fewer cases on the whole were completely cured; there being rather more in which amputation was performed, and a few who withdrew themselves from all further treatment—a class which of course does not exist on the other side.

On the whole, we may say that, allowing for accidental circumstances, the results of the two methods have been as nearly identical as is possible in a long series of cases extending over many years and a large variety of districts. And this, I must say, is to me a striking argument in favour of the more recent method.

When we heard, some years ago, on the first introduction of excision of the knee into general use, the statements which its advocates made as to its freedom from danger or any other drawback, and the abuse which was unsparingly heaped upon those who were somewhat reluctant to accept the new treatment as a proved advance on the old, we could not avoid doubting assertions which showed so little of the caution and moderation that ought to follow on experience in practice. Such rose-coloured views of operative surgery almost carry their own refutation. *Quodcunque ostendis mihi sic, incredulus odi.* So if I should come here to assert that the modern treatment of aneurism was free from all risks of failure, or that the Hunterian operation is other than a most efficient and successful method of treatment, I should feel that I was abusing your patience and doing little credit to the position in which you have placed me. The truth is that the treatment by compression very often fails, that it has difficulties from which that by ligature is entirely free, depending as it does on careful attention to a number of minute details on the part of the surgeon, and exacting sometimes from the patient prolonged submission to an irksome and distressing ordeal from which he knows he can withdraw himself at any minute. All this is quite different from the progress of a case after ligature. When once the vessel is tied the surgeon has little more to do in most cases, and the patient nothing. If the case does well, in fact, no further treatment whatever may be required; with the simplest dressing, or sometimes with no dressing at all, the wound is found healed, and the case is at an end.

That a method of treatment which has been so recently adopted into general use as that by pressure should have already attained the same amount of success as one which has been perfected by the experience of a century, during the whole of

which time it has been the favourite study of some of the greatest surgeons of their time, is surely a most gratifying fact, and one which promises results still more successful. For we must remember that as we advocate the operation of excision of the knee in appropriate cases, in consequence of the prospect which it holds out of a more useful limb, although we believe that the danger is as great or greater than that of amputation, so we might fairly advocate the adoption of the compression treatment of aneurism in preference to the immediate resort to the ligature, even if we believed that the one was no more successful, on an average, than the other. For though the difference is not certainly so great between the limb after compression and after ligature as it is between the result of an excision and an artificial limb, yet it is a very great difference indeed. The ligature of the main artery of a limb leaves the member weakened, ill-nourished, and often prone to obstinate and hardly curable ulceration. The main artery is always obstructed at one part, and usually at two (*viz.*, the seat of ligature and that of aneurism); and the indirect circulation can never entirely replace the direct. The cure by pressure (whether indirect or direct) does not necessarily involve any such obliteration, as these preparations from St. George's Hospital museum show (*vi.*, 121-2, 126). And to this must be added the far more powerful consideration, that in successful cases of pressure the patient is exposed to no danger whatever, and sometimes to really no inconvenience; whilst such cases, instead of being exceptional, are really, I believe, the majority, provided that the treatment is undertaken at an early period and the sac is well formed and complete.

The results, then, of this table fully support, to my mind, the view which I entertain, that the cure by pressure ought to be attempted in all ordinary cases of popliteal aneurism. When the sac is imperfect, or even very weak, it is better, I think, to resort to ligature at once; and if the aneurism is situated towards the knee-joint, or is rapidly growing, I do not advocate long perseverance in the attempt at compression; nor, indeed, do I think that in any case protracted compression is a benefit to the patient, or diminishes the percentage of failure.

These conclusions I believe to be justified by our present experience. But we must always remember that the methods of compression are being constantly improved. The triumphs of the rapid form of pressure under chloroform, the success of digital pressure, the rapid and painless cures sometimes obtained by flexion, are amongst our most recent experiences; and they are too striking not to attract all possible attention from practical surgeons, and to show that we do not know by any means all that may yet be accomplished by compression.

Most surgeons, of whom I am one, much prefer the digital to every other form of pressure when a sufficient number of really well-trained and trustworthy assistants can be obtained; while others, believing that digital pressure is liable to be unsteady and that it gives more pain, and having a perhaps exaggerated idea of its difficulty, prefer some form of tourniquet.

I shall speak first of digital pressure. The notes furnished to me from the various hospitals do not give any sufficient data for estimating the average success of digital compression, considered as the sole means of treatment. I find one case in which, after nearly complete cure by the tourniquet, four hours of digital compression produced complete consolidation. But, excluding this, there are only six cases in which it seems to have been the sole means of cure, out of the 66 successful instances of compression. The notes of these cases, as far as they go, show strikingly how much more rapid, and consequently how much less distressing, this treatment is when it does succeed. In one case the cure was obtained in sixteen hours, in a second in twenty-six hours and a quarter, in two others in thirty-six hours, in a fifth in three sittings of eight, sixteen, and ten hours each. In the remaining case the time is not given. There is also among the failures of compression one case in which, after twelve hours of digital compression, the surgeon, for some reason, resorted to the ligature (and with success), although the tumour was found to be some what harder. This very probably was not really a failure of compression; some accidental circumstances might very likely have made it inconvenient to prolong the treatment. All that we are entitled to say, then, from our hospital table, is that, though the treatment by digital pressure has come into general use in our hospitals too lately to be fairly reported on, yet such experience as we have had of it justifies the belief that, when, well and carefully employed, it is a most efficient, rapid, and painless method of applying pressure.

The records of published practice are collected in the most accessible form by Fischer. He quotes and refers to 90 cases in which digital compression was used—either alone or in combination with instrumental pressure or flexion—for the cure of popliteal aneurism. Out of these 90 cases there were 17 in which instrumental pressure had been previously employed and had failed, and 3 in which flexion had been previously employed and had failed. In all these 20 cases the cure is attributed to the digital pressure only. There were also eight cases in which the instrumental and digital pressure were used simultaneously, and therefore no precise judgment could be arrived at as to the share which each had in the cure. The total result of these

90 trials of digital pressure as the chief or the only means of cure was as follows:—Digital pressure succeeded in 55 cases. Ligature was used in 23 (of which 14 were cured, 1 recovered after amputation, 1 was not cured, 1 result doubtful, and 6 died); 4 cases were afterwards cured by instrumental compression, combined in 2 with flexion; 2 were amputated, and both died; 3 cases were cured by injection or perchloride of iron, manipulation, and acupressure respectively (but the latter case is an error, I think). In the remaining 3 cases no further treatment was adopted (as far as is known). This gives out of the 90 cases—76 complete cures and 1 cure after amputation; 4 in which the treatment seems to have been given up; 1 where the result, after ligature of the femoral for varicose aneurism of the popliteal, is doubtful; and 8 deaths (6 after ligature and 2 after amputation). A ratio of 8·9 per cent. of deaths and 14·4 per cent of failures.

If we compare this ratio of deaths and of failures with those above given as prevailing after other methods of treatment—as for example, the Hunterian ligature, when used at once,—we do not see any very striking statistical proof of superiority, considering that digital pressure is not ordinarily used as the chief method of treatment in the worst cases. But, as I have often before remarked, the statistical method of reasoning is not really of much use as applied to the treatment of any given case. No one would stop to calculate averages in order to make up his mind what to do in any of the emergencies of practice. The statistics of digital pressure are nevertheless useful as showing that the treatment is one which is fairly successful, even with the limited experience hitherto obtained of it. A fairer view of the advantages of this form of pressure may be derived from considering some of the peculiar features of recorded cases.

There can be no question, in the first place, that the finger of a trained and intelligent person is a more discriminating, more accurate, and less distressing agent for stopping or checking the circulation than any form of instrument, however ingeniously devised. The femoral artery, as it lies in the groin, side by side with its vein and in close proximity to the bone, can be easily commanded, in a thin or even in a moderately stout person, with little expenditure of force, with an almost total absence of pressure on the vein, and usually without much pain, provided that the person compressing knows how to make the pressure. Now all these points are of great importance, and they together constitute a very great superiority for digital as against instrumental pressure, considered with respect to its facility of application only.

In the first place, the slight force which is required to com-

mand the femoral in the groin renders it easy for the patient to undertake his own treatment when necessary. This is now illustrated by so many examples, and is so well recognised as a means of treatment for patients who have the necessary intelligence and resolution.

Again, we have in digital pressure in the groin a far more efficient method of avoiding that compression of the femoral vein along with the artery which has so unfavourable an influence on the course of many cases of instrumental pressure. However dexterously a tourniquet pad may be adjusted and maintained, it is, I believe, utterly impossible not to press to some extent on the femoral vein, even in the groin, where the two vessels are lying side by side; although possibly the whole flow of blood through the vein may in some cases not be obstructed; and the high authority of Dr. Bellingham may be quoted in support of this view—that instrumental pressure cannot be so managed as to avoid the vein, even where the vessels pass over the pubes. And lower down, where the vein inclines more and more to the deep surface of the artery, the simultaneous obstruction of the two vessels becomes still more inevitable and still more complete, so that low down in the thigh the pressure which obstructs the artery acts, it is probable, first on the vein; and if the arterial circulation is to be suspended, that in the vein must also be totally stopped. Now the pressure of a tourniquet pad influences the skin over a considerable surface; and in order to vary the point of pressure, the alternating pads must be applied at a considerable distance from each other, changing from the groin to about the middle of the thigh. Thus, much interference with the venous circulation is unavoidable in instrumental pressure. The finger, on the contrary, can select and isolate the artery in the groin with perfect ease. It can be pressed down on the vessel from the inside, insinuating itself between it and the vein, and so avoiding all pressure on the latter. And the point of pressure can be changed frequently, though only to some little distance, where the vessels have much the same relations to each other, above the origin of the profunda. The point to which Mr. Walker, of Liverpool, has directed attention is also worth bearing in mind—viz., that by varying the point of pressure from the common to the superficial femoral, we are, in reality, changing the course of the anastomosing circulation. He urges, therefore, the importance of what he calls “the one-artery system” of pressure, and this is certainly easier the smaller the compressor is.

It appears decidedly desirable on all accounts to interfere as little as possible with the vein. Cases are not wanting to show that the vein is often permanently obliterated after pres-

sure : on which point I would refer to M. Verneuil's paper in the *Gaz. des Hôp.* for 1859. And besides the possibility of actual obliteration of the vein at the point of pressure, there can be no doubt of the injurious effect of that engorgement of the whole limb which is often caused by its temporary or incomplete obstruction, and therefore of the great advantage of any plan which can be limited, as far as possible, to the artery only.

In practice digital pressure has been found to be far less painful than that by tourniquets of whatever construction, and less painful also, as I believe, than that by the weight, though I have often seen this borne with little distress. This depends chiefly, as it seems to me, on the care with which it can be graduated, so that no unnecessary force whatever is employed. If two well-trained assistants act together—one observing the pulsation while the other compresses,—the stoppage of the pulse can be effected with the minimum of force, and occasional intervals of repose can be given to any portion of the skin which is becoming irritated.

Vanzetti records a case in which the pain in the aneurism, which had been very acute, was at once relieved by digital pressure ; Mr. Holt one in which the patient slept during the application of the pressure.

Fischer refers to 17 cases in which instrumental pressure was so painful that it had to be given up ; and in 11 of these digital pressure was successfully carried out. In Broca's work 29 cases are given in which instrumental pressure was intolerable—in fact, the invention of digital pressure seems to have been due in great measure to the pain caused by the instrument.

The applicability of compression in cases of disease of the artery itself is a circumstance which should never be lost sight of, and which is illustrated by numerous examples in all parts of the body. Thus the striking case of axillary aneurism under Rizzoli's care which I narrated last year, and in which the subclavian could be felt enlarged and hardened by atheroma, could never have been treated with any hope of success by ligature, but was cured by pressure.

An interesting example in the case of popliteal aneurism is quoted from Gallozzi by Fischer. Here there was a popliteal aneurism, which is said to have been “diffused,” of the size of the fist, and the femoral artery could be felt, atheromatous, as high as the external iliac. Continuous digital pressure for nine hours took away the pain in the tumour, and next day the disease was cured.

Such pressure is far more safely applied by means of the finger than by any tourniquet, since it is of the last importance

not to use any excess of force over an atheromatous or ossified artery.

The rapidity of the cure in digital pressure is one of its great advantages, closely connected with the less force which it requires and the less pain which it produces. The patient is thus enabled to bear the prolonged application of an efficient amount of pressure, and cure is often produced with astonishing rapidity.

In Fischer's tables an average has been struck of the length of time occupied in the treatment of the successful cases of digital and instrumental compression respectively. This table refers to aneurisms of all the various arteries of the body, but we may apply its general conclusions to popliteal aneurism only without risk of error. It shows that 34·7 per cent. of the cases of digital pressure were successful in the first twenty-four hours, while only 10·1 per cent. of those of instrumental pressure were so; and 86 per cent. of the former recovered in the first fortnight, against 53 per cent. of the latter. The mean time required for cure in the list of cases of digital pressure was about three days, and of instrumental pressure about fourteen days.

Digital pressure is commonly spoken of as being much more difficult to carry out properly than instrumental pressure is. On that subject I am very far from being convinced. It is true that it takes little trouble to have an instrument screwed on, anyhow. But to apply instrumental pressure really in an efficient manner, constant care is necessary, and the patient ought to be watched by the surgeon himself or some perfectly competent assistant during the whole time of treatment. This constant supervision during a much longer period may certainly counterbalance to a great extent the physical labour of the manual pressure.

The difficulty in making effectual digital pressure varies much in different cases. Some persons have more knack as well as stronger fingers than others, so that one man will suppress the pulsation with ease where another can only do so with great labour; and usually the inconvenience to the patient varies with the trouble to the attendants. Pressure which is easily applied is also, as a rule, easily borne. Lay assistants must be carefully instructed in the method of applying pressure, and in the direction in which the artery is most easily caught; and, if possible, it is well to combine a professional assistant with each. Assistance is sometimes usefully given to the compressing finger by a weight laid upon it, as recommended by Mr. Holden. He says, in reporting a case of successful digital pressure in popliteal aneurism (combined, however, with instrumental): "We devised a plan of assisting the fingers by super-

imposing a weight upon their ends. The weight consisted of a long slender bag filled with 12 lb. of shot, By this means we saved muscular force, and enabled the fingers to act for nearly two continuous hours, without any fatigue or inconvenience except a little numbness over the nails." On this plan thirty hours of continuous pressure were perfectly well borne. The pressure was then left off, as the aneurism appeared cured; but the symptoms recurred in about twenty-six hours, and ultimately the cure was completed by instrumental pressure. Mr. Holden remarks that, had the pressure been kept up for forty hours instead of thirty in the first instance, it would in all probability have been completely successful.

Unless some such assistance is given to the fingers, few persons can keep up pressure efficiently for more than about ten minutes or a quarter of an hour; and it is necessary, therefore, to organise a staff of compressors, who take charge of the artery in pairs—one pressing while the other watches the aneurism, and changing as soon as the fingers become at all tired or unsteady, care being taken that the artery is not released from pressure as the hands are changed.

Digital pressure should always be made with sufficient force to stop the pulsation of the tumour, and no more. The plan of allowing a perceptible amount of circulation to go on through the tumour, which was a favourite one in my younger days, and was recommended by the Dublin surgeons, is now, I believe, allowed not to have any advantage. It is quite possible that some blood may be really passing through the aneurismal sac, even though no pulsation can be felt; but however this may be, it is certain that the total obliteration of pulse in the aneurism does not retard, but, on the contrary, greatly hastens the cure, and that in some cases the disease has been cured in a very short time. The shortest times which I have found assigned to the cure of a popliteal aneurism are in the following cases. One, under the care of M. Sernin Fontan, where the tumour (the size of a goose's egg) became quite solid after three hours and a half of compression, though pressure was continued as a precaution for four hours more. The permanence of the cure was verified in this case. Dr. Mapother has related one which was cured in five hours and three-quarters. Mr. Bryant's patient above alluded to cured himself in four hours and a half. In Blackman's case the patient was cured by three hours of compression in the groin. And the shortest time of all is one of Vanzetti's cases, where only two hours and a half were consumed in the treatment.

Such very rapid cures will, of course, be only seldom met with, but the averages stated above show that in about one-third of the successful cases the cure has been obtained in the first

twenty-four hours. Now it is almost always possible to keep up continuous pressure for this length of time in any patient who is not too irritable to bear pressure at all. And if so kept up properly, I have no doubt most cases would either be cured or in a fair way of being so. But when the attempt has been carried on for this length of time without success, it must in general be suspended from exhaustion of the patient or of the assistants, and now it may be advisable perhaps to supplement it with instrumental pressure, or to use digital pressure in the intermitting manner for about two hours at a time twice a day. The sac will by this time probably have become well lined by fibrine, so as not to yield to the distending force of the circulation when re-admitted, and fresh accretions will be added with each compression, until the whole tumour is obliterated.—*Lancet*, May 1 and 8, 1875, pp. 599, 637.

42.—ON LIGATURE OF A MAIN ARTERY TO ARREST ACUTE TRAUMATIC INFLAMMATION.

By C. F. MAUNDER, Esq., Surgeon to the London Hospital.

[The idea of applying a ligature to the main artery of a limb for the cure of acute traumatic inflammation was suggested by the fact that compression to the vessel had been so applied.]

Supposing compression to be resorted to, and, for some reason or other, to be relinquished too soon, blood would then not only pass to the inflamed spot through the enlarged smaller vessels, but also through the main channel, and thus an additional and injurious supply would be added.

On May 13th, 1866, I recommended the ligature of the femoral artery in a case of wound of the knee-joint followed by traumatic fever and acute inflammation below, about, within, and above the knee. The man who had sustained the accident was under the care of my then much-esteemed colleague, Mr. L. S. Little; and that gentleman tied the superficial femoral artery, with immediate and striking relief to symptoms. The patient, who was in imminent danger of losing, possibly, both limb and life, was from that moment in comparative safety, and made a good recovery.

Lacerated wound of the knee-joint; acute inflammation; ligature of superficial femoral artery; immediate relief; recovery.—Joseph C. was admitted into the London Hospital, under the care of Mr. L. S. Little, on May 3rd, 1867, having sustained a lacerated wound, opening the knee-joint. When seen by Mr. Disney Thorpe, the house-surgeon, an hour after the accident, synovia was escaping. The wound was closed with three silver sutures, a back splint was applied, and the joint surrounded

with bags of ice. He passed a good night without pain. The next day there was some effusion into the joint; but there was no heat nor constitutional disturbance.

May 5th. Effusion less; patient very well. Ice to be continued, as he complains of pain if fresh ice is not frequently applied.

6th. So well that he was placed upon full diet.

11th. There is some redness along the inner side of the knee, and some pain.

12th. Knee-joint much increased in size, red, and tense with fluid. Great and incessant pain, which is much aggravated if the joint be touched.

13th. Joint still more swollen. It feels hot notwithstanding the continued application of three large bags of ice. The redness has extended some distance up the thigh, particularly on the inner side, where the tissues are brawny, also down the leg. The patient is suffering much from pain and sleeplessness, with a pulse of 120, anxious countenance, and general constitutional disturbance. At 10 a.m. he had a rigor. I now saw the patient in consultation with Mr. Little, and proposed the ligature of the superficial femoral artery as a means of arresting the inflammation. Mr. Little, courteously acting on my suggestion, boldly and dexterously tied the artery at once (4 p.m.) at the apex of Scarpa's triangle, the patient being under the influence of chloroform. The redness paled somewhat at once; and the patient, on recovering from chloroform, remarked, with surprise and delight, "my pain is gone." Half an hour after the operation the pulse was 100, having previously been 120. 10 p.m.: No pain since operation. Thinks he'll sleep. Pulse 96; less redness; toes cold, but sensible to touch.

14th. 4 p.m. Toes warm; knee cooler and less red, but with a sense of numbness about it; pulse 90, feeble. To have six ounces of wine.

15th. 3.30 p.m.: Says he is "first-rate;" better appetite; heat about the heel prevented sleep (pressure from splint); knee and thigh smaller and paler; the ends of the accident wound began to discharge very thick pus about two hours ago; pulse 100, firmer; tongue cleaner.

16th. 4.30 p.m.: The patient had some starting pains during the night, so that he slept badly. As the discharge from the knee was now considerable, the quantity of wine was increased to ten ounces. Pulse 98.

17th. During the night he had a profuse sudden bleeding from the nose.

June 1st. Ligature removed to-day. Has gone on uninterruptedly well, with the exception that the wounds have been

very slow in healing, and showed little power, particularly that on the thigh, which discharged very freely.

June 26th. Sat up to-day.

P.S. The patient gradually regained the use of his limb, and acquired free motion to the extent of 20°. Three months after the man was quite well, but the range of motion appeared to be limited by thickening outside the joint. He refused further interference, as he can do his work satisfactorily. He is here to-night.

I need scarcely say that when this idea of mine had been put in practice (1866) with pre-eminent success, it created considerable discussion in the profession, and many surgeons came to see the case. Since that time certain articles on inflammation published in this country have advocated this as one of the methods of treatment. Mr. Bryant says "To arrest acute inflammation in a limb, the deligation of the main artery of the limb, or the arrest of the circulation through it by pressure upon the artery, has been adopted. Dr. Campbell, of New Orleans, speaks highly of the practice, and even affirms that no portion of an extremity should be amputated for destructive inflammation without the surgeon attempting the practice. Upon the suggestion of Mr. Maunder, of the London Hospital, in 1867, Mr. Little applied a ligature to the femoral artery for acute suppuration of the knee, with a success sufficient to prove its value; and the late Mr. Moore, of Middlesex Hospital, acupressed the brachial artery with a good result." Dr. Robert Druitt in his article "Inflammation," naturally jealous for originality emanating from his own countrymen, says: "Mr. Maunder, of the London Hospital, has tied the femoral artery in several instances of severe inflammation of the lower limb, and has spoken favourably of the results. Mr. Maunder's first case was so treated by him without any knowledge of the American experiences we have referred to, and his results were as satisfactory as those of Dr. Campbell. The late Mr. C. H. Moore also compressed the brachial artery for severe traumatic inflammation of the hand, acting on Mr. Maunder's suggestions, and in that case also the remedy had a very striking effect."

The advantages I claim for the ligature are best shown by a review of the above case. Immediately on the application of the ligature, pain, previously severe, ceased; and with this cessation sleep and appetite returned. On the following day the countenance was changed from one expressive of physical suffering to that of repose, and in forty-eight hours the man pronounced himself to be "first-rate." Symptoms of inflammatory action, both general and local, quickly subsided—redness paled, swelling disappeared, and the integuments, pre-

viously rendered red and œdematous above, about, and below the knee, soon assumed their normal character. On the day of operation Mr. Little and I were not sure whether or not pus was already formed (the man had experienced a slight rigor in the morning), but inclined to the opinion that a small quantity did exist immediately under the skin and middle of the line of the wound, which was healed. We also thought it quite probable that the synovial membrane of the joint had already begun to secrete pus. About forty-eight hours subsequent to operation, both ends of the original wound opened spontaneously and discharged pus, the matter flowing in small quantity, and as though it welled up from the interior of the joint. During this suppurative stage the patient experienced no discomfort, with the exception of slight starting pains for one or two nights, and after the lapse of a few days, the discharge of pus, except from the surface of the accident wound, ceased. Another and all-important advantage is, that no blood is taken from the patient; and the subject of these remarks was in no condition to lose an ounce of the vital fluid.

Since then I have tied a main artery twice, with a view to arrest inflammation in a limb, and my colleague, Mr. Reeves, has ligatured the superficial femoral with a similar object. Also, in several instances in which the ligature has been used to stop bleeding, existing inflammation has ceased, and repair commenced. The first of the former was that of a child whose knee-joint had been opened by a burn.

Open knee-joint; suppuration within and without; ligature of the femoral artery; recovery.—A. P., aged three years and a half (Case 12 in Table of Arteries), was admitted into the London Hospital, under the care of Mr. John Adams, Feb. 5th, 1869. She had sustained a severe scald by boiling water over the lower part of the abdomen and thighs, and especially of the right knee. She progressed favourably for several weeks, when, on April 8th, the house-surgeon, Mr. Vials, observed an abscess on the outside of the knee, which broke on the following day.

April 10th. The patient had recently come under my care (by reason of Mr. Adam's retirement from the office of surgeon). At the site of the abscess a depression in the granulations admitted the little finger into the joint. The cavity contained pus, and an incision made on the inside favoured its flow.

19th. Suppuration has spread round about the joint, and up and down the limb, and incisions have been made here and there. A drainage-tube was introduced to-day through the joint.

28th. Limb is more swollen, and two more incisions are made. The discharge is very profuse, and the limb is dressed

twice daily in consequence. Drainage-tube removed. Eats and sleeps pretty well.

29th. The whole limb is now oedematous from groin to toes, and pus can be squeezed out in large quantity at the various openings made from time to time. The child is very exsanguine and emaciated, but takes its food fairly, sleeps pretty well, and has a clean tongue. 3 p.m.: I placed a fishing-gut ligature on the superficial femoral artery at the apex of Scarpa's triangle on the antiseptic plan, everything coming in contact with the wound having been treated with a solution of carbolic acid. The ligature was cut short, and the wound closed by three metallic sutures and then covered in with layers of lint soaked in carbolic glycerine. The whole limb was carefully wrapped in cotton-wool, and a flannel bandage and splint applied to secure immobility at the knee. A large piece of lint saturated with carbolic glycerine was laid upon the thigh. There is nothing special to record concerning the operation. The vessel was deep by reason of the swollen state of the integuments, and a nerve larger than usual crossed the sheath towards its inner side; the femoral vein was not seen, and not a teaspoonful of blood was lost. The toes looked white and tallowy after the ligature of the vessel. 9 p.m.: Child is asleep; cries when the toes are touched, but moves them freely, they having very much the same appearance as the toes of the opposite member, and are equally warm to the hand.

30th. 3 p.m.: Sitting up; clean tongue; no appetite; strong odour of carbolic acid; much less discharge; toes colder than those of opposite foot. To have six instead of three ounces of wine. To use as little carbolic acid as possible, lest it affect the child's general health injuriously, which it already probably has done.

May 1st. Clean tongue; has eaten a little meat to day. Removed the flannel bandage and cotton-wool, and pressed out matter which had accumulated since the operation. Incised a fluctuating swelling, giving exit to pus which existed at the time of operation, on the inside of the knee. The whole limb, excepting the operation wound, dressed from the foot upwards with strips of lint. Wool and bandage reapplied and a back splint adapted.

2nd (only seventy-two hours after operation). Nurse says the discharge is only a quarter as much as it was formerly. All swelling has subsided. Relishes food.

3rd. Feeds pretty well. There is a vesication on the heel (from pressure). The little pus discharged from the various wounds is very *thick* in character.

7th. On exposing the operation wound to-day it was

found gaping and granulating, the sutures being detached by ulceration, but there was no discharge. The child takes milk, wine, eggs, and bread-and-butter freely, but very little meat. There is *not a tablespoonful* of discharge from the whole limb, now only the ninth day subsequent to operation.

It will thus be seen that the operation was markedly successful, the quantity of discharge being reduced to one-fourth. Subsequent to the ligature a small slough from continuous pressure formed on the heel, and I was very anxious about it. To my surprise the slough separated, and the wound healed as readily as though the normal circulation of the limb had not been interfered with. The child made a good recovery, although naturally weakly and the subject of ophthalmia, for which it was treated by my colleague, Mr. James Adams.

Question of operative interference.—With reference to the history of the case up to the time of operation, it is evident that the progress of the condition of the limb was from bad to worse. In the first instance, when the joint was found to have been opened, swelling and suppuration seemed to be restricted to its interior, but soon these limits were overstepped, and pus was found round about the joint on all sides. To give free exit to this, incisions were made, and a drainage-tube was passed through laterally, one end of the tube appearing on the inside of the articulation and the other in the popliteal space, to give exit to matter existing in that locality and to favour gravitation. The original wound on the outside of the joint allowed the matter to escape in that region. In the course of a few days further incisions were necessary above the knee, and on the day before operation matter had burrowed half-way up the thigh and half-way down the leg, and an incision in both situations gave exit to a large quantity of offensive discharge. On the day of operation the whole limb was cedematous, probably as a prelude to, or coexistent with, further diffuse suppuration.

Now, although the child's general health was fair, still the local symptoms threatened to become worse rather than to improve; and if the former state resulted, not many days would elapse before either hectic or typhoid symptoms would arise, when in the former case proximate safety would be in amputation, but in the latter there would be no hope of recovery. By ligature of the femoral artery I hope to save both life and limb.

By resorting to the ligature, I of course believed that suppuration would in great measure be arrested, and that amputation or death, necessitated by exhaustion, would be

prevented. Also, I am of opinion, of two evils—profuse suppuration or ligature—I had selected the lesser; because I have not that dread of the consequences of ligature of the superficial femoral artery, under certain conditions, which some surgeons profess. I was greatly induced to operate in this case in consequence of an observation made in Mr. Little's case just related. A few hours before Mr. Little operated his patient had had a rigor, and we were led, from certain symptoms, to suspect that suppuration had already taken place in the joint, the original wound being at this time closed. In this suspicion we were probably correct, because, although both local and general inflammatory symptoms declined immediately after the application of the ligature in the most decided manner, still, some forty-eight hours subsequently, the original wound reopened, and the *thickest* possible pus flowed, or rather oozed up, evidently from within the joint. This thick pus was made up of just enough liquor puris to make it a soft solid—a condition due, I thought, to the withholding of fluid from the limb by the ligature on the artery.

The two preceding cases will contrast well with the following, in which ligature of the brachial was performed apparently to little purpose only.

Case 18, in Table of Arteries, was one of acute inflammation of the hand, in a middle-aged female, consequent on a poisoned wound. The whole hand was enormously swollen, with the fingers bent upon the palm. Her temperature was 103°, and the patient was greatly exhausted and had a dry brown tongue. Just above the wrist was a patch of redness, as though suppuration either had already or was about to set in. I tied the brachial artery in the *middle* of the arm, but it is most essential to notice that the effect upon both local and general symptoms was very slight when compared to the alteration for good with ligature on the main artery in the *lower* limb. Pus formed above the wrist, but the palm escaped and the fingers were no longer flexed. The patient died two months later of pyæmia. In the future, should the necessity arise, I would ligature the brachial artery close to the axilla, in order to get above the origin of the *profunda* branches, with the view of still further diminishing the supply of blood to the hand. The arterial anastomoses about the elbow are so numerous that, although the brachial be tied about its middle, its effect upon the blood-supply to the hand will sometimes be too transitory for my purpose, as regards inflammation, but highly conservative with respect to the vitality of the part, as the subjoined show. I tied the brachial for false aneurism, in a young man (Case 16). A good radial pulse existed next

day. Also in a man aged sixty-six (Case 13). There was a pulse at the wrist on the third day.

The fourth case known to me is that of a male adult who had sustained an incised wound opening the knee-joint, associated with severe venous hemorrhage. The bleeding was arrested with difficulty, and violent inflammation of the joint followed. I saw the case in consultation with Mr. Reeves on August 3rd, 1870, and advised ligature of the superficial femoral. The man was extremely exhausted and wasted, and for days no hope of saving him by amputation had been nor could now be entertained. The discharge was most profuse both from the joint and thigh; perspirations copious; temperature 103° ; pulse 135; and a large patch of redness had lately arisen over the front and inner side of the articulation. The benefit derived from the ligature in this case was almost ephemeral. The man ultimately died.

I shall now give you some American experience. I have received, through the courtesy of Dr. G. C. Blackman, of Cincinnati, U.S., a *résumé*, published by him in the Cincinnati Lancet and Observer of February, 1868, of the cases of traumatic inflammation treated in that country by ligature of the main artery, and which are well worthy of careful study. I will condense the information that I have gleaned. Up to this moment no one had hinted in any way that the operation had previously been performed. It was utterly unknown in this country. It appears probable that the femoral artery was ligatured for wound of the knee-joint, first by Henry U. Ouderdonk, M.D., in June 1813; and that the patient was cured. A similar case was so treated by Dr. David L. Rogers of New York; and in this instance "the man got well by the twenty-fifth day." Dr. Rogers also refers to a case of compound dislocation of the ankle, in which Dr. Mott tied the femoral artery; but the patient died of tetanus. Dr. Rogers is of opinion that "the danger of mortification from defect of circulation is less than might be supposed" (and that has long been my opinion). "A lad sixteen years old, was the subject of a most severe and extensive gunshot wound of the arm. The brachial artery was ligatured high up, and although little hope was entertained of saving the arm, to the astonishment of all who saw the case there was merely sufficient inflammation in the wound to produce healthy suppuration and granulation. He recovered rapidly." Dr. H. F. Campbell, of Georgia, speaking from personal experience of six cases, is also a strong supporter of the principle. Dr. Daniel F. Wright, formerly of Winder Hospital, Richmond, records a case of gunshot wound of the thigh, followed by hemorrhage, and treated by ligature of the femoral at the apex of Scarpa's triangle. "The injured limb

was for some days slightly colder than the other, notwithstanding which the condition of the wound commenced improving from that day." A second case was one of gunshot wound of the middle finger, requiring amputation. Gangrene set in, and spread rapidly; hemorrhage occurred twice, and then the brachial artery was ligatured in the lower third of the arm. Improvement in the wound commenced at once. A third case is one of gunshot wound of the thigh, followed by spreading gangrene and repeated hemorrhage. The femoral artery was tied at the apex of Scarpa's triangle, and "the wound healed more rapidly than any lesion of such extent that I have ever witnessed." Two other cases are recorded by Dr. Wright, but were not immediately under his care. The brachial artery was tied in both instances "with a result exactly similar to that in the cases already detailed." Dr. Wright remarks: "In the five cases witnessed by myself, and in the six cases reported by Dr. Campbell, we have this uniform result—that, immediately from the date of ligation, large tumefaction has been superseded by recovery of the original contour, fetid ichorous discharge by laudable suppuration, and phagedænic gangrene by vigorous granulations, resulting in rapid separation of the eroded tissues. . . . In all the instances I have given, though the ligature resulted in curing the gangrene, it was not resorted to for that purpose, but for that of arresting hemorrhage. In the present state of professional opinion it would be bold surgery, savouring perhaps of rashness, to tie the brachial artery for gangrene of the hand, or the femoral artery for phagedænic erosion in the calf of the leg; though my friend Dr. Campbell does not stop short of advocating this very procedure." Also Dr. D. L. Duvall remarks that, in a paper published at Richmond by Dr. S. P. Moore, Surgeon-General of the Insurgent States, the author stated "that he had performed operations on patients whose limbs, after being wounded, presented all the indications of rapidly approaching gangrene from inflammation, when, fortunately for the patient, extensive hemorrhage ensued, which necessitated the ligation of one or more of the large arteries of the limb, and, to his great surprise, rapid improvement began and the patient recovered." Velpeau too appears to have given this method of combating inflammation his consideration, and in the American edition of his great work on Operative Surgery (vol. i., p. 649) says:—"As compression of the arteries moderates, and even arrests, the circulation in the organs situated underneath (beyond?), it seems at first sight to constitute an excellent remedy in congestions, engorgements, and acute inflammations of all kinds. It is therefore somewhat surprising that physicians should, for so many years, have omitted to make use of it under this point of view. At the present time

(1839) the mind appears to take another direction; and compression of the arteries, if we are to believe its partisans, should become the sovereign remedy in convulsions, epilepsy, inflammation of the limbs, &c."

However pathologists and physiologists may explain inflammation, however complex may be the process, whatever share in its production may be ascribed to the vascular system, to the nervous system, and to the tissues themselves the seat of it, I presume all will admit that an excess of blood is brought to the part. The experience of practitioners in the healing art had from time immemorial taught the value of the withdrawal of blood as a remedy for certain inflammations. Thus we have arteriotomy, venesection, the use of leeches, &c. But all these methods have this diadvantage in common—they *remove* blood from the system. Obstruction of the main channel, on the other hand, only *withholds* it from the inflamed part, and may be likened to dry cupping, by which the blood is diverted into other channels *temporarily*, and thus the inflammation is, as it were, starved. Lawrence says: "Blood is the material by which the increased action of the part is maintained. In the figurative language, which the obviously increased heat has suggested, one may say that it is the fuel by which the fire is kept up. If one could completely command the supply of blood, the increased action might be effectually controlled or arrested."

In considering the propriety of placing a ligature upon a main artery with a view to arrest acute traumatic inflammation in the part beyond, various questions must be entertained. First, the *possible* and *probable* result, if the case be treated on general principles hitherto accepted; secondly, the effects of the ligature (upon arteries such as the femoral and brachial) *immediate, intermediate, and remote*. On the other hand, in contemplating, in not a few instances, the effect of acute inflammation, of the knee-joint for example, subsequent to a wound of the same, the prospect is not at all cheering; and I know of no case in surgical practice of injury to a limb, not requiring immediate amputation, which excites more anxiety in the mind of the surgeon for the welfare of his patient than traumatic inflammation of this joint. Its effects, both local and general, are quickly manifested. Swelling, redness, and pain, precursors of suppuration, attack the joint and the limb both above and below, while traumatic fever runs high. After the lapse of a few days pus is formed in and about the joint, and for weeks, while the articulation is being destroyed, suppuration spreads and burrows up and down the extremity. During this period the patient's powers, both nervous and vascular, are becoming exhausted by pain and loss of sleep and appetite, consequent on the progressive destruction of the joint structures,

as well as by the more or less profuse suppurative discharges. All this time, too, he has been exposed to the risk of erysipelas and pyæmia; and at length, to escape death from hectic, he submits to amputation, with a poor chance of recovery.

W. D., twenty-eight years of age (Case 17, Table of Arteries), became the subject of acute suppuration and sloughing of the soft parts of the hand and forearm, and disorganisation of the wrist-joint, associated with recurring hemorrhage. To prevent further bleeding, and to remove structures damaged beyond useful repair, I advised amputation; but the patient declined, and I was obliged to be content with ligature of the brachial artery. He died of pyæmia on the eleventh day. No sooner had the operation been performed than inflammatory symptoms abated: swelling disappeared; suppuration, which had been profuse, was reduced to a minimum; sloughing ceased, and granulations quickly arose. I must say I was somewhat surprised at this beneficial result of the ligature, for the parts were so damaged by the previous inflammatory action, added to the injury, that I thought it likely gangrene rather than repair might result.

But it sometimes happens that the result of such an accident is still more disastrous, the patient dying after weeks of suffering in possession of the damaged limb, because no opportunity for amputation, with the hope of a successful result, had presented itself.

H. P., (Case 9), a man aged forty-seven, was admitted on March 9th, 1867. He had sustained a severe squeeze of the knee. Suppuration up and down the limb and disorganisation of the joint followed; but the man was too ill to be submitted to amputation, and he ultimately died of hemorrhage.

On the other hand, and under the most favourable circumstances that can be anticipated, the prospect is gloomy. A patient may recover with his joint more or less ankylosed and distorted, and the limb more or less useless in proportion to the degree in which its various component parts have been involved in the inflammatory process.

Peter J., aged twenty, was admitted on November 6th, 1873, having received an injury to his left knee ten days before. In about a fortnight after the accident the knee-joint was laid open, and a large quantity of pus came from it. He was in the hospital six months, during which period very many incisions were made here and there to let out the matter, and drainage-tubes were used from time to time. For many weeks from three-quarters to a pint of pus was discharged twice daily. He ultimately recovered, with ankylosis. You will presently see this patient, but I fear you will be able to form a very inadequate idea of his former condition judging from his

present shapely and useful limb. This happy result is due to the great care and attention bestowed for weeks and months upon the case by my house-surgeons (Messrs. Mitcheson and Kershaw) and dressers (Messrs. Jones, Treeves, Needham, Snell, and Harvey).

It would be out of place to discuss here the treatment of disorganised joints with a view to prevent displacement of bones and consequent inutility. Suffice it to say that, in the instance of the knee (a joint especially liable to luxation) that you will see to-night such unpleasant accident has been prevented, and, ankylosis being necessary, the proper angle (a most essential point for the patient's comfort in progression) has been attained.

John P., aged twenty-seven, was in the hospital at the same time as the former patient. Incisions about the joint were made, and a drainage-tube was used once. The inflammatory action of a comparatively mild character was more restricted to the neighbourhood of the joint than in the former case. From time to time a fresh attack of inflammation occurred, and these kept him in the hospital almost as long as the above patient who suffered so severely. Even now, twelve months since he left the hospital (March 18th, 1873), the limb has not recovered itself, while that of his fellow-sufferer is most useful. In this case an excess of synovia was the chief secretion from within the joint, associated with a little suppuration outside the capsule. You will see that the man has a firmly fibrous ankylosed joint; and he is an example of the injurious influence of a constitution spoiled by intemperance, upon local injury.

In rare instances—so rare, indeed, that they can scarcely be allowed to influence our prognosis—the patient escapes with a comparatively sound joint. A. B., about eighteen years of age, sustained a blow upon the knee, followed by suppuration within the joint. This was evacuated by an incision on the outer side, and the patient was quickly well. The girl has perfect use of the articulation.

I especially invite your attention to these three patients to-night, because they were all under care at the same time, under the same roof, under the same surgeon, under the same atmospheric and hygienic conditions; but differed in one grand and all-important feature—in constitution. Each illustrates a stage of the disease which it is important to recognise during its progress, with a view to prognosis. The young woman has recovered, probably without a trace of the result of the injury existing to-day; the young man (of intemperate habits), while showing comparatively slight signs of local mischief, suffered severely in his general health, and even now repair is not complete; but the patient whose limb it seemed, to most who saw it, impossible to save, and which was twice condemned

by my experienced medical friend, Mr. Stilwell, of Epsom, survives. It will be difficult even for those who saw him at his worst, and almost impossible for any who never saw him, to credit the transformation. The reasons of my withholding operative interference—either ligature of the femoral or amputation—were, his cheerful and hopeful disposition, a clean tongue, good nights, and never-failing appetite. But, above all, although the cartilages were destroyed early in the progress of the case, and the articular ends of the bones were exposed, these latter never became involved in the inflammatory process, and he was always free from “starting” pains. This symptom is evidence of disease which very often leads to operative interference, occasionally to death. On the other hand, we had to combat a most profuse discharge coming from all parts of the limb, and a disorganised knee-joint. (It will be out of place to discuss here, in connexion with profuse suppuration, how far a large supply of aliment favours this; but I think it worthy of consideration whether or not we overfeed some patients.)

The picture I have drawn, I believe truthfully, of the probable consequences of traumatic suppurative inflammation of the knee-joint is very discouraging. Can we hope for better things from ligature of the main artery? I think I have proved it.

I will now consider the possible effects—immediate, intermediate, and remote—of ligature of the vessel.

The *possible immediate effect* is gangrene of more or less of the limb, varying from the shriveling of a toe to death of the whole leg as high as the ligature. But this is scarcely likely to happen, because, an excess of blood having been now sent to the part, the collateral circulation may be regarded as already in some measure established. Case 21-22 in the Table of Arteries, a female aged forty-nine, in a very depraved state of health, and the subject of diffuse cellulitis with extensive sloughing about one foot and ankle, was submitted to ligature of the anterior and posterior tibial arteries of the same side, to arrest recurring hemorrhage, she at the time being too weak for amputation. The acute symptoms subsided at once, and hemorrhage did not recur. She soon died, and the whole foot and ankle seemed to have lost their vitality; but whether any part of this was due to the ligature it is impossible to say, sloughing having already commenced previous to the operation.

The *possible remote effect* is a permanent weakening of the limb, rendering it less valuable as an organ of progression, and, by lowering its vitality, making it less able to bear changes of temperature or to resist and repair injury and disease. I must repeat, as worthy of special notice, that in the case of the child already mentioned, within a week of the operation a slough

formed on the heel from direct pressure. Knowing how slowly such accidental wounds often heal, I feared that in this instance it would be slower still. I was agreeably surprised to find that my anticipations were not realised; the sore closed quickly.

The *possible intermediate effect* is hemorrhage at the seat of ligature, from either the proximal or the distal side. (The former complication requires a re-opening of the wound, and search to be made, under difficult pathological conditions, for the bleeding orifice, that a ligature may be reapplied; or, if this cannot be accomplished, the trunk of the vessel must be exposed as near as practicable to the bleeding point, and a thread be passed around it. The latter accident will probably be combated by a well-applied graduated compress and bandage.) This subject was fully discussed and illustrated by cases in my former lecture.

Besides the above-mentioned possible consequences of ligature of the superficial femoral, we must not neglect to inquire into the influence of the operation upon the process of repair necessary to the restitution of the injured limb to health.

In the Paris revolution of 1830 Jobert tied the femoral artery (I presume the common femoral is meant), with a view to cut off the supply of blood from this region brought by the profunda, for hemorrhage in a case of gunshot fracture at the neck of the femur. Jobert remarks that the operation acted as a powerful antiphlogistic agent, and that the resulting inflammation and suppuration were much less than generally follow these injuries. The patient recovered.

Granted that a given supply of arterial blood is necessary to health, and that to repair an injury more than the usual quantity is requisite, one would expect either that repair would be slower after ligature than without it, or that the disease would degenerate from the acute to the chronic, or perhaps even to the ulcerative or gangrenous. And I am inclined to think that, in the case which was the origin of my operation and these remarks, the wound which opened the joint, as well as a small incision made subsequently over the inner side of the knee to give exit to supposed pus present there, healed more slowly than they would have done had not the vascular supply of the limb been interfered with. If I am correct in this opinion, questions arising out of it are, At what age and state of the constitution, and at what stage of the disease, is this method of treatment admissible? At present I am rather of opinion that the age and state of health of a patient (with special reference to his heart and arteries) who would have the barest prospect of recovery from an uncontrolled suppurative inflammation of the knee-joint would weigh with me against the use of the ligature, and I should try compression, either digital or instrumental.

In all probability the injury would be fatal under any circumstances.

The stage of the disease at which ligature of the main vessel (femoral, for example) would be contra-indicated would appear to be, judging from very limited experience, the suppurative, but of long standing. This observation is supported by the progress of Mr. Reeves's case. The good effect of the ligature was very transient—a circumstance probably due to the high vascular condition of the part consequent on prolonged inflammation in it. On the other hand, judging from equally limited experience in the child, profuse suppuration of a more recent date may be arrested by the ligature. In the upper extremity, in which arterial anastomosis is more free and repair more readily effected, the brachial artery might be ligatured, at a more advanced stage of suppuration, with every prospect of success. In Cases 12, 15, and 17, instances of inflamed hand associated with extensive suppuration and some sloughing, a favourable change occurred directly after the application of the ligature to the brachial artery. The *precise* moment and *indication* for the application of the ligature in the lower extremity is when suppuration is only suspected to have occurred, or has only just set in.

When enumerating the risks inherent to the ligature, the possible ill performance of the operation—a segment or whole of the vein being included in the ligature—ought not to be omitted.

Time does not allow me to compare further the result of acute suppurative inflammation treated on the *ordinary* principles of surgery with the *extraordinary*, or ligature of the main artery. As I have said elsewhere, I believe the sudden obstruction of a main artery to be very much less dangerous than is generally supposed. We have been apt to draw our conclusions from instances of known diseased vessels, as in cases of aneurism. I was once present when a friend accidentally wounded the superficial femoral artery while opening an abscess in the thigh. We at once placed a ligature above and below the wound in the vessel, and no ill consequences whatever arose.

On Sept. 7th, 1867 (Case 10, Table of Arteries), I placed a double ligature upon the superficial femoral artery of a young man within an hour of its being wounded. He quickly recovered without the least sign of want of circulation in the foot. Again, in 1871 (Case 11), I ligatured the superficial femoral for a contused lacerated wound of the vessel. The man was of intemperate habits. Gangrene attacked the wound, and the man died ten days subsequently; but there was never the least evidence of insufficient supply of arterial blood to the foot.

These cases suffice to show how rapidly the collateral circulation is established, and the part does not perish. Wardrop, also, says: "The enlargement of the anastomosing vessels to a certain extent takes place almost instantly after the trunk has been tied. I observed this in a child in whom I had secured the carotid artery. I could see the branches of the temporal and occipital underneath the delicate integument enlarging, and thus actively acquiring great additional vigour immediately after the operation."

There is thus accumulated a fair amount of experience to show that the principle of *withholding* blood from an inflamed structure, under certain conditions, is immediately beneficial. As to the means to this end, let them be as innocent as may be consistent with success. I would not for a moment insist on the application of a ligature in all cases where the principle is to be tried, provided that a simpler method will suffice, whether by compression with a tourniquet, by acupuncture needle, or by hand. But it must not be forgotten that it is one thing to suggest a mode of treatment and another thing to carry it out efficiently. The ligature once applied, all anxiety as regards the passage of blood ceases; but less decided measures above-mentioned require such care and attention to details as can rarely be given. Having witnessed the value of the principle, I do not hesitate to urge upon the profession a trial of it when practicable. It may appear strange that I have not tied an artery oftener for inflammation; but I did not wish to ride my hobby to death, nor to bring the principle into discredit.

Facts and conclusions.—That ligature of the superficial femoral artery has arrested acute inflammation consequent on a wound of the knee-joint.

That ligature of a main artery will quickly diminish profuse suppuration, and prevent death by exhaustion.

That, while it arrests profuse suppuration, it will, by allowing the patient to gain strength, afford an opportunity for amputation at a future time.

That gangrene and secondary hemorrhage, as the result of ligature, should not be anticipated in the healthy subject.

That the dread of these has arisen from our knowledge of the consequences of the ligature in instances of known diseased vessels—aneurism for example.

That a slough on the heel, caused by the pressure of a splint, was quickly detached, and the wound soon closed, although the superficial femoral had been tied a few days previously.

That symptoms of inflamed bone ("starting pains") quickly disappeared.

That the arterial tension of the rest of the body will be increased beneficially by the ligature.—*Lancet*, July 3 and 10, 1875, pp. 1, 43.

43.—CLINICAL LECTURE ON A WOUND OF THE PALM.

By J. W. HULKE, Esq., Surgeon to the Middlesex Hospital,
and to the Royal London Ophthalmic Hospital.

Perfect rest of the hand and forearm, enforced by fixing them upon a splint, in wounds of the palm attended with arterial hemorrhage, is the measure I desire particularly to impress on you. When you cannot reach the cut artery and tie or twist it, it is not enough to bind a graduated compress on the wound, and put the hand and forearm in a sling; nor will you have taken every precaution against a recurrence of the bleeding when, in addition to a well-adjusted compress, you have methodically bandaged the limb from the finger-tips upwards, a proceeding which may seldom be safely omitted; but you should also secure the hand and forearm upon a well-padded splint reaching beyond the fingers and above the elbow, and strictly forbid the slightest attempt on the patient's part to actively move the limb. If he wishes to shift its place he must lift it upon the splint with his other hand.

This may perhaps seem to some of you unnecessarily strict, considering the small size of the arteries in the hand and the usually trivial dimensions of these wounds. But, in truth, these palmar wounds are by no means unimportant,—they are amongst the most troublesome and anxious with which you will have to do, and they may never be treated negligently. Small as the vessels are, owing to the free anastomoses here they bleed very copiously—so abundantly, indeed, that exceptionally (as in old or otherwise feeble persons) even death may follow in a few minutes the infliction of the wound. Not many days since, the lifeless corpse of a man was brought to the hospital, who had shortly before gashed his hand with a broken bottle. His neighbours, whom he had left only a few minutes before, had found him seemingly lifeless on the ground in a pool of blood.

It is, I believe, to the neglect of adequate precautions during the first few days that these wounds so often take an unfavourable course,—that they slough and inflame, and bleed again and again, until at length the surgeon is compelled to tie the radial and ulnar or the brachial artery (at this stage always under unfavourable conditions), and the patient is fortunate if he escapes with his hand not over-crippled and permanently damaged. Some of you will not have forgotten a man in Broderipp ward last summer, who had wounded his palmar arch with a splinter of glass, and who, against the House-Surgeon's remonstrance, would not come into the hospital, but attended as an out-patient during several days; for he obstinately refused to believe that a little wound, which to

him appeared only a mere prick, could be very serious. At length repeated losses of blood and great swelling of the hand forced him to become an in-patient. It had become necessary to tie the brachial artery in order to save his life, and he recovered with a permanently weakened hand and a stiff finger. Since this you have had the opportunity of watching a very parallel case under Mr. Clarke's care. Now, I think that the unfortunate consequences might have been avoided if the man had immediately entered the hospital, and submitted to the plan practised in the following case.

A stoker, aged twenty, on the night of December 14 last, was brought into the hospital in a swoon from loss of blood. He had a few minutes before been stabbed through the hand with a large sailor's knife in a brawl. The blade had passed through the fourth interosseous space, making a cut three-quarters of an inch long in the palm, where it encroached on the carpus, and a rather shorter cut in the back of the hand. He very quickly lost so much blood as to faint, when the bleeding ceased spontaneously. The House-Surgeon adopted the customary measures in such cases; he bound a graduated compress firmly upon the wound in the palm, raised the hand and forearm on a pillow, and put the tape of a tourniquet loosely round the arm as a precaution in case of fresh bleeding. When I saw the patient at the mid-day visit I took off the tight compress from the palm, closed the gaping wound on the back of the hand with a couple of very fine stitches (as it was neither infiltrated with extravasated blood nor swollen), then bandaged each finger separately and carried the rollers up the forearm and arm, placed a piece of lint dipped in carbolic oil upon the palmar wound (not stitching this, because its edges were somewhat infiltrated with blood), and upon this a small compress very lightly secured, laid the hand and forearm on a well-padded splint, supporting the palm with a ball of wool, and enjoined the strictest rest, forbidding the patient to lift the arm off the pillow except with the other hand. The pillow was so placed that the hand and forearm rested upon it nearly on the level of the shoulder as the man lay in bed.

Two things will probably have occurred to you: the tight compress was exchanged for a very light one; and the raised posture of the arm was replaced by one nearly horizontal. So long as a patient can move his hand, the efficient control of the bleeding can only be attained with considerable pressure, and this the tissues so compressed cannot bear long without sloughing. When this happens, too often the wound bleeds afresh, and too often this is met by readjusting the compress still more tightly, to be productive of still more mischief. It is, therefore, very desirable to use only the minimum of pressure

absolutely necessary. Greatly raising the hand in wounds or abscesses, which some do by slinging it from a gallows, is a practice I never follow, because I think any advantage due to the lessened force of the arterial circulation obtained by an approximately vertical direction is outweighed by the additional facility this posture gives to the downward diffusion of inflammatory matters from the hand into the forearm, leaving out of consideration the irksomeness of the posture. I believe that all the advantages obtainable by a tight compress and by a nearly vertical posture of the hand and forearm, without their accompanying disadvantages, may be gained by methodically bandaging the limb from the finger-tips upwards (as practised by a Dublin *confrère*), a light compress, and that strict rest which only a splint insures.—*Medical Times and Gazette*, May 1, 1875, p. 463.

44.—TWO CASES OF VARICOSE VEINS OF THE LOWER EXTREMITY TREATED BY EXCISION.

By N. DAVIES-COLLEY, Esq., Assistant Surgeon to Guy's Hospital.

Having observed with what safety the synovial cavities of joints and the sheaths of the tendons might be opened under Professor Lister's antiseptic treatment without fear of exciting suppuration or diffuse inflammation, I was induced last summer to apply his method to the radical cure of varicose veins in the lower extremity. From the success which attended the experiment, I think the operation bids fair to supersede all other plans of operative treatment, which have hitherto been employed in this troublesome complaint. The following are the only cases in which I have as yet applied the method.

George G., æt. 34, was admitted into Job ward, July 29th, 1874, under the care of Mr. Davies-Colley. He is employed at some whitening works in Bermondsey, and has a great deal of standing. About two and a half years ago he began to suffer from swelling of the veins on both legs, which has gradually increased up to the present time. He has had them bandaged, but without much relief, and has been obliged to leave off work on account of the pain which they have caused him.

On admission.—The veins of both legs are considerably enlarged, but his chief trouble is a varix on the inner side of the right thigh, a short distance above the knee. This forms an elevation $4\frac{1}{2}$ inches long, by $2\frac{1}{2}$ inches broad, $\frac{3}{4}$ inch above the level of the surrounding skin. It has a lobulated appearance, as if it were formed by the convolutions of a vein as thick as the little finger. From its position it seems to be a part of the internal saphenous vein.

August 3rd. Chloroform having been administered and the blood removed from the limb by the application of Esmarch's elastic bandage and tourniquet, Mr. Davies-Colley made a longitudinal incision 5 inches in length over the varix. He then dissected out the whole of the convoluted mass which turned out to be a single irregularly dilated vein, more than a foot in length, when extended. A catgut ligature was applied to the vein at the upper and lower parts of the swelling and the whole of the intermediate portion was removed. No sutures were used to draw the edges of the wound together. A spray of carbolic acid diluted with 40 parts of water was employed during the whole of the operation, and the wound was dressed with carbolic gauze dipped in a mixture of 1 part of carbolic acid to 40 of olive oil. The elastic band, which had been used as a tourniquet was taken off before applying the dressing, and a small amount of venous hemorrhage occurred which was readily controlled by pressure.

During the operation it was found that the varix lay upon the internal saphenous vein, which was not much if at all larger than normal. As there was no apparent connection between the diseased vein and the saphena, the latter was not interfered with.

No febrile symptoms followed. A considerable blood clot undermined and separated the edges of the wound for some days after the operation. Some suppuration then occurred, and shreds of fibrous tissue with portions of softening clot were discharged for three or four weeks. There was, however, no extension of inflammation to surrounding parts nor any sloughing of the skin, and the ulcer which was left healed rapidly. On September 14th, he was allowed to get up, and on the 18th he went out.

On February 2nd, 1875, I learned that he returned to his old employment two or three weeks after he left hospital, and that he had been able to work regularly at an occupation which necessitated continual standing. He had had no further trouble from swelling of the veins, although he had worn no bandage to support them. There was no pain in the legs, and he felt better than he had been for several years before.

Lydia A., æt. 22. Admitted into Dorcas Ward, under Mr. Davies-Colley, August 12th, 1874.

Patient has been married three years, and has had one child, who is now two years old. Before her confinement she noticed a swelling in her leg, but suffered no pain. This enlargement of the vein has continued up to the present time. A short time ago she undertook the nursing of a fellow-lodger who was ill. The unusual strain put upon her leg from walking about and standing caused it to become very painful. She

came as an out-patient for about five weeks, and was then admitted into the hospital.

On admission.—Patient looks in good health and strong. On the inner side of her left popliteal space at the back of the inner tuberosity of the tibia, there is a swelling 2 inches long by $1\frac{1}{4}$ inches broad, and elevated $\frac{1}{3}$ inch. It is continuous below with an enlarged vein which commences near the internal malleolus. No other veins are enlarged.

14th. Chloroform having been administered, Mr. Davies-Colley made an incision about two inches long through the thin skin over the swelling on the inner side of the popliteal space. He then dissected out the vein at the lower part of the varix, and having carefully isolated it placed a thin catgut ligature round it, and divided it above the ligature. The cut end was then held with a dissecting forceps, and the swollen vein above readily separated by gentle traction and a few touches of the knife from the surrounding structures. A fine piece of catgut was tied round its upper extremity, and the intermediate portion removed.

There was little hemorrhage, although no means were taken to arrest the flow of blood through the veins. The carbolic spray was used during the operation. Catgut sutures were inserted and the wound dressed with carbolic gauze. A short back splint was applied to the knee.

The wound was dressed in the same antiseptic manner on the 16th, 17th, and 19th. No discharge except of bloody serum was observed, and the whole healed up by primary union. The patient went out on the 9th of September.

On February 2nd, 1875, I examined the limb and found that there was still a slightly enlarged vein from the inner ankle up to the cicatrix left by the operation. The patient however suffered no inconvenience from it, and was able to walk about quite comfortably.

These two cases are examples of the successful application of a very old operation. In Celsus de Medicinâ, lib. vii., chap. 31, the excision of large varices is recommended, and a similar method to that adopted with these two patients is described. The same plan has also been employed by many British surgeons, but it fell into disuse on account of the diffuse inflammation and pyæmia, which have occasionally followed its application.

By the careful employment of antiseptic measures during the operation, and in the subsequent dressing, I believe that these dangers may be averted.

The practice of ligaturing the veins over pins, and then subcutaneously dividing them, is not altogether exempt from danger, and it is in some respects decidedly inferior to the one

above described. There is always considerable uncertainty as to when the pins can be safely removed, and the subcutaneous section of the vein is occasionally inadequate to produce its obliteration, whereas, after excision, the destruction of that part of the vessel is complete, and the patient is spared the inconvenience of having the pins in his skin, and the pain of their removal. If I had applied the ordinary method in the first of the cases I have described, there would have been serious danger of transfixing the internal saphenous vein, as I had thought that the varix was formed by that vessel, and should therefore have been at no pains to avoid injuring it. We are often deterred from operating on varices by the fear that, if we remove them, other veins will enlarge to carry on the circulation instead, so that the condition of the patient will soon be no better than it was before. If, however, the varices are produced, as in this case, by the enlargement of superficial veins, while the great trunks are free from disease, I think we may regard the affection as local, and need not fear the compensatory enlargement of the neighbouring veins, as the removal of the varices will not materially interfere with the return of the blood from the limb. In operating again by this method I shall endeavour to avoid taking away so large a piece of the vein as in the first case, for the recovery was delayed by the wound having to heal by granulation. In the second case the wound was small, and united by primary union—a result which it is probable that we may generally count upon if we take care to cut away only a small portion of the vein, and to disturb the tissues as little as possible.—*Guy's Hospital Reports*, 1875, p. 431.

45.—ON NÆVUS.

By Dr. GEORGE BUCHANAN, M.A., Professor of Clinical Surgery in the University of Glasgow.

Nævus, which is an example of one of the varieties of aneurism by anastomosis, exists principally in the integument, but it may occur in the subcutaneous tissue; hence we have cutaneous and subcutaneous nævi. In a large number of instances, these two kinds of nævus are combined in the same example, but, when we have two distinct specimens, the one cutaneous, the other subcutaneous, the characteristics are a little different. Cutaneous nævus exists as a red patch—a red spot upon the skin—and, as it very often is found immediately after birth or at birth, it is popularly called mother's mark. In the form of a red spot upon the skin, it may have no tendency to spread; it may remain a permanent patch of the size it was

when the child was born, or it may tend to spread over the surface of the skin, as we see in the example before us. Subcutaneous nævus exists as a tumour, swelling, or protrusion of the integument. It produces a bluish tinge of the surface, and is soft, puffy, elastic, capable of being compressed and reduced in size by the emptying of the vessels, but returning to its original size when the pressure is taken away. This subcutaneous nævus exists in the tissue between the skin and the adjacent structures; in other words, underneath the cutis in the adipose tissue; and it is soft, yielding, and elastic, and the tumour may rise to a considerable extent. Now, in the case before us, you have a very well marked specimen of the two kinds; nævus maternus proper, or patch upon the skin, combined with the subcutaneous projection or tumour caused by disease of the vessels of the subcutaneous tissues.

Let us for a moment or two attend to the first kind; the nævus maternus, or mother's mark. Very little explanation is necessary for it. It is simply an exaggeration of the capillary circulation; hence it is called capillary nævus. When circumscribed, as it very often is, within the circumference of the patch, the size of the capillary vessels is increased, and the consequence is that, instead of being pale pink, it becomes red in colour, slightly turgid, from the increased quantity of blood-corpuscles. It may, therefore, be described as a condition of the skin in which the capillary circulation is enormously exaggerated, and consequently the part becomes more swollen. Most commonly, it is congenital; but sometimes, as in the case we have just seen, it begins a few weeks after birth, and, when it begins after birth, its tendency to spread is greater than when the child is born with it.

If, therefore, you are called to see a child born with a nævus of small size, and if you notice that within the next few weeks there is no tendency to enlarge, you are not to be in any great hurry to deal with that spot. But, if the spot enlarge rapidly after birth, or if it make its appearance some time after birth and begin to enlarge, then is the time to attack the nævus maternus, if you wish to do it in an effectual way. A minute spot of nævus maternus, which is a very important thing, especially in the case of females, when it attacks, as it usually does, the head or face, can very often be satisfactorily treated at an early stage. There are a great number of ways of treating it.

If it be very small, a very useful way is by vaccination; by putting the vaccine vesicle upon it. The vaccine vesicle runs its course and results in a cicatrix, which involves the whole tissue of the nævus maternus. The effect is, that what was a red mark becomes a pale cicatrix. If it be not larger than a

finger-nail, then by applying a number of points of vaccine lymph round the circumference and perhaps one or two in the centre, you include a large portion of it in the vaccine disease, and it frequently has the effect of obliterating the spot. Then the vaccine vesicle equally protects the child from small-pox, as if it were applied in other parts of the body, consequently you are, so to speak, killing two dogs with one stone. You will often fail, however. Conversing with general practitioners who undertake the treatment of this condition in the child, you will find almost every one of them say that, though they succeed in one or two cases by the adoption of this method, there are a great number of failures. And, in my own experience, I have been called on frequently to deal with cases of *nævus* which have been unsuccessfully vaccinated at an early stage; but I only bring this forward in order to prevent you being discouraged when you are unsuccessful with this mode of treatment. In a considerable proportion of cases, vaccination will serve the purpose of curing the disease; in others, it must be treated in another mode.

Another way of treating *nævus*, when of small size, is by introducing red-hot needles. The needle of the galvanic cautery will coagulate the blood, produce inflammation, and cause the destruction of the tumour and the obliteration of the spot. The point of a needle dipped in nitric acid, or in a concentrated solution of perchloride of iron, sometimes has the effect, all of these aiming at the same thing: coagulation of the blood in the skin or *nævus*.

These are examples of methods of treatment of the simple form of *nævus maternus*; but, when it comes to be a case of the other kind, which is the case that is most frequently dealt with in hospital, such a method of treatment is altogether unsuitable. Subcutaneous *nævus* or *nævroid* tumour, to which I refer, consists of a dilatation of the vessels of the venous side of the tumour; hence it is often called venous *nævus*. To understand my observations, recollect that a tumour of the nature of aneurism by anastomosis is found of two varieties, according as the venous side of the circulation or the arterial side is affected. I am disappointed in being unable to show you a patient whose presence I expected, a good example of the arterial variety of the tumour; but I may state that, when a subcutaneous tumour results from dilatation or enlargement of the arterial side of the circulation, it is called *cirroid aneurism*. In that case, the tumour is semi-solid, pulsating, and presents many of the characteristics of aneurism. It most naturally occurs somewhere on the forehead or on the scalp in the inosculation between the temporal and occipital arteries. In the instance referred to, the tumour consisted of dilated arteries, which, under

the finger, felt serpentine, being compressible and soft, evidently from being thin in their coats. They have somewhat the character of veins, except that they are pulsating; hence the tumour into which they enter being full of tortuous dilated vessels like varicose veins is called cirroid.

I shall devote the rest of the time to the consideration of the nature of venous subcutaneous nævus. This exists in the form of tumour, elastic, compressible; and, when we take the fingers and compress it, we can diminish its size by the force which we apply to it. When a tumour of this kind can be removed from the body, it is found in its interior structure to have a close resemblance to the corpus cavernosum or corpus spongiosum penis. It consists of two tissues—a quantity of fibrous tissue, which forms, as it were, the envelope of the tumour and the blood-vessels contained in the interior. On a section of the tumour being made (such as I now make of the one removed three weeks ago), it is found to consist of a number of threads of fibrous tissue dividing the interior into a large number of spaces, which are not separate exactly one from another, but communicate with each other. Among these threads or trabeculæ there pass a number of vessels connected with the arteries which enter the tumour on one side and the veins which leave the tumour on the opposite; and the vascular tissue in the interior is not composed of capillaries, but capillaries which have become enormously dilated, and in which gradually the walls of the dilatations have come to be adherent; and one very often finds that perforations have occurred between one of these dilated capillaries and the other; so that instead of the blood passing from a series of vessels, it passes through a series of blood-spaces, which have resulted from the destruction of the walls of these dilated capillaries. Hence any injury to such a tumour containing blood lying in these blood-spaces must be a dangerous thing and greatly to be feared.

Now, this nævus may occur in almost any part of the body; but I need scarcely say that the parts where it most naturally occurs are the most vascular; those parts where the communications between the vessels are most frequent; namely, the scalp, brow, and face, and generally the front part of the body, but not exclusively, for I have seen nævi upon the back, upon the thigh, and upon the buttock, and almost upon any part of the body you could name; but the vast majority of nævi occur upon the face and head, and consequently in places where the deformity is very great indeed. The tendency of these nævi frequently is to spread and involve more of the adjoining tissue. In the example we have before us, the spot made its appearance at the side of the eye, and gradually has extended to the other side of the face and down upon the neck as far as the breast.

Such cases frequently occur; but there are others that extend and grow outwards, and are more dangerous, though not having so great a circumference.

With regard to the treatment of subcutaneous nævus, various methods may be adopted. It is to be remembered that in them the circulation is sluggish, as you would naturally suppose from the description I have given you of the condition of the vessels; but, when the tumour is injured, dangerous hemorrhage may ensue, and hence various plans have been proposed and put in execution for their removal, most of which I shall mention. The first plan has for its object to coagulate the blood in the tumour, and in consequence produce contraction and obliteration. There are many modes by which the blood existing in the tumour may be coagulated, the result of which would be consolidation and contraction of the tumour, and gradual absorption of the condensed tissues produced. One of the most common modes is by inflammation produced in the tumour by the introduction of a seton. The needle is threaded with cotton thread. The thread may be dipped in some acrid substance, and the tumour may be transfixed in several places and the string left in the interior. As I mentioned to you, the circulation is not very active, and it is some encouragement to you that the hemorrhage in such an operation is rarely worthy of notice. The thread left in the tumour produces a certain amount of inflammation, and that inflammation coagulation round the thread; and, if two or three threads are passed through, there will be two or three lines of coagulation, and so it spreads till the whole tumour is consolidated. If you do not succeed in the first instance, another series of threads may be passed through, and, in the end, the tumour will be consolidated. That method only applies to tumours of a comparatively limited extent. Another plan of dealing with nævus is by the application of caustic substances, especially when it is a combination of the two kinds of the disease, and when the tumour is of comparatively small size, and is upon the edge of the lip, the tip of the nose, the brow, or the cheek. The application of strong nitric acid on a piece of wood held against the spot for a considerable time has the effect of producing an eschar or slough. That slough may separate with a certain amount of inflammation; that inflammation coagulates the blood, and gradually obliterates the tumour as before. The third plan is to produce coagulation in the interior by the introduction of the galvanic cautery, or a red-hot iron, if you like—the actual cautery. But the galvanic cautery is best, because it gives you a continually red-hot needle. It produces coagulation in the neighbourhood of the needle; the coagulation extends till the tumour is consolidated and obliteration

takes place. Another plan is to introduce, by means of a very fine syringe and hollow needle, a drop or two of perchloride of iron. Perchloride of iron is, of all salts of which we are aware, the one which most rapidly coagulates the blood; hence, when we have hemorrhage from a wound in which we cannot get the blood-vessels tied, we take a small bit of perchloride of iron, or take a piece of lint and dip it in a solution of perchloride of iron, and it will coagulate the blood at once. A few drops of this fluid introduced in subcutaneous nævus will coagulate the blood, and produce consolidation and obliteration as before. Take care, however, that you never employ this form of treatment of nævus in the neighbourhood of a large vein, such as a nævus situated at the lower part of the neck, which is a rare thing, or a nævus near the circumference of the orbit, because a portion of the blood coagulated by the introduction of this fluid may become detached, and may form what is called embolus, or a floating clot, and may get into the circulation of the blood and float away nobody knows where; and may continue floating on until it produces a plug, which may interrupt the circulation in the vessels and produce serious consequences. I knew a case in which a few drops of perchloride of iron were introduced into a subcutaneous nævus on the eyelid of a young child. I was not present, but the description of the result was to me appalling. The child was brought alive, and looking well on its mother's knee. A drop of perchloride of iron was introduced, and in two minutes it was dead, just as if shot through the head with a pistol. A particle or portion of the coagulated blood had entered into the ophthalmic vein, and had gone back and got plugged in some part of the venous circulation at the base of the brain, or orbit. Congestion or stagnation of the blood had taken place, and the result was fatal. Such are the principal plans that may be adopted to produce consolidation.

When the tumour is too large, or when it has resisted all these plans—and you will frequently find examples where these plans are not capable of being performed, or, where having been tried, they have proved ineffectual—there are other two methods by which a tumour may be removed. There is, first, by ligature. Ligature is applicable to nævus when it is circumscribed; when you can, without difficulty, pass a needle under the base of the tumour. The needle is armed with a piece of string, then the string is passed beyond the edge of the tumour, brought underneath its base, and made to emerge beyond its base on the opposite side. The tumour is again transfixed at right angles to the former direction, and a double ligature is brought through underneath the tumour. We have thus two ligatures passing underneath the tumour in one

direction, and two passing through in the opposite direction. Next, the ligatures are tied together, and then the whole is constricted and tied together by the free ends. Thus the whole of the base of the tumour is circumscribed, and strangulation takes place by the string passing round the base of the tumour. If the surgeon be not satisfied with the result of the strangulation, he can put another ligature round the base on the outside. If the skin be affected, the tumour is transfixed without any previous operation; but, if it be subcutaneous, and the skin comparatively unaffected, it may be saved by dissecting back four flaps, and the tumour may be transfixed as before. That, up till very recent times, has been the general plan of treatment, and it is often effective; but it always involves a certain amount of doubt as to the surgeon having got to the bottom of the tumour, and it also involves a long and troublesome process of sloughing and separation; consequently, of late years, we have begun to adopt—and I have seen very few cases in which it cannot be adopted—the method of excision; and it seems to me that we are coming to use this method of dealing with vascular tumours a great deal more freely than formerly. When I was a student, I used to be much afraid of a great number of things we do now with the utmost confidence. When I was a student, nobody would have ventured to have put a ligature on a vein, for fear of the vein becoming inflamed. Nowadays, we never allow a patient to leave the operating-table after amputation when any tendency to bleeding exists, without securing the veins, so that hemorrhage may be completely arrested. Nævus was for a long time treated by ligature or consolidation, in consequence of the fear entertained of adopting incision upon these tumours; but I need not do more than refer you to the case brought before you the other day, in which I performed an operation, which I told you at the time looked almost appalling, but which, in consequence of the arrangement of which I am going to speak, was performed with comparatively little difficulty and very little hemorrhage. These nævi, when circumscribed, are more or less incapsulated. This capsule consists of the very tissue which permeates throughout the interior. While there is no well-defined capsule in which it lies during the progress of its growth, the tissue gradually becomes so condensed, that it forms itself into a capsule; hence, if you adopt the plan suggested by John Bell, which is the principle that must guide us in dealing with these tumours—namely, never to cut into it, but to cut it out—you can deal with almost any tumour. Apply the knife in such a way as to cut the tissue exterior to the tumour, and by your incision take out the tumour entire. Do not spare it; do not leave a single bit of it; cut on the exterior of it, and lift it out with its cap-

sule, as you saw this one, which was removed about a week ago from the child I am going to show you, and you will be perfectly certain that you have got beyond the tumour, with no danger of bleeding. You thus remove the whole of the tumour, and the only thing you have got to do is to deal with the vessels entering into it from the outside; and the number of vessels entering into one of these tumours is not so great as you would expect; consequently, when you saw the tumour removed the other day, we had only to deal with the mouth of the facial vein and that of the facial artery and one or two small ones that exist in any child's face. As in the operation by ligature, it is of vast importance, for the sake of the appearance of the child afterwards, to save the skin. For this purpose, you must make the incision upon the surface of the tumour in such a way as to enable you to dissect off any portion of the unaffected skin. If the surface of the skin be entirely healthy—I mean if the integument over the subcutaneous tumour be altogether healthy—you may apply your cuts in such a way as is most suitable to the situation; but, in the case I had to deal with, and the result of which I shall show you, a portion of the skin was affected as well as the subcutaneous tissue. You must have been surprised to see the irregularity of the incision made over the surface of the tumour to save the pieces of the sound skin. And, when the operation was completed and the parts readjusted, it was matter of surprise to myself how the pieces of skin dissected back served the purpose of covering the wound upon the child's face after the enormous excision was made. When you save as much of the unaffected skin as possible, leave it comparatively loose, and, after granulation of the surface, the skin will gradually flap back into its place and unite in a way that will be perfectly surprising.

(Child brought in.) This child had an enormous *nævus*, extending from the edge of the eyelid down to the angle of the mouth, and protruding to a great extent. In the centre of the tumour, there was a cutaneous *nævus* about the size of a crown; and, at the inside next the nose, there was another cutaneous *nævus* about the size of a shilling. An incision was made, as you saw, in such a way as to save the skin covering the eyelid, and another so as to save the lower half of it. These flaps were turned back, and the whole cheek was exposed. This tumour (on the table), with the enclosed *nævi*, now blanched by being preserved in spirit, was cut out of the cheek, leaving those small flaps on the face. This was done three weeks ago, and we now find that, although there is a considerable amount of *œdema*, there is sufficient skin left to cover the surface. Within three weeks of an operation, of course it

is impossible to speak as to the ultimate result; but, in the meantime, the child has recovered from the effects of the operation in a way that is very gratifying.

The whole front of the face between the eye and the mouth, which was exposed, is now healing up; cicatrisation has taken place at a certain point, and is rapidly proceeding at others. In the meantime, it appears to you swollen. That depends upon the œdema upon the eyelid, near the nose, which will very much diminish. I believe that the child will recover, and that the tumour will altogether disappear, with an amount of disfigurement in the face exceptionally small.

The operation must have appeared to you a very painful proceeding, and it was one which I undertook with a very great deal of anxiety, in consequence of the great extent of the incision to be made, and the amount of tissue to be removed; yet I did it with very great confidence, in consequence of an operation which I performed two or three years ago. I expected to have had the child here, but I have been disappointed, its parents having left the city for Fife. That tumour was greatly larger than the one now before you, and it was much more troublesome, as it involved not only the skin and the subcutaneous tissues, but the mucous membrane of the mouth. It extended from the angle of the eye down to the nostril and into the mouth; in fact, involving the whole of one side of the cheek, from the integument into the mucous membrane, and presenting a case almost intractable. The child was in great danger; otherwise it was a healthy child, and, on account of the disfigurement, it was impossible to deal with the case in any other way. I performed the operation accordingly, and removed the whole of the cheek by introducing the *écraseur* at the superior angle, and by putting pins through the cheek beyond the limits of the tumour on both sides, the whole cheek involving the affected tissue was removed by a sort of A-shaped section made by the *écraseur*, which I used instead of the knife, on account of the amount of hemorrhage which I feared would take place. When the operation was completed, the gap was something frightful to look at; but, with a little stretching, we succeeded in bringing the two sides together. The operation being performed by the *écraseur*, it produced a rough edge rather than a clear incision. But the patient being a growing child, in which the circulation is active, adhesion took place, and it was dismissed from the infirmary when the edges of the wound united, although I must say its appearance was far from attractive. Last year, I had occasion to perform an operation upon a man in one of the suburbs of Glasgow, and, after it was completed, a person in the house said, "Do you know that child?" (pointing to a child about four years of age). I said, "No." I was

then asked to look at it a little better. I did so, and said, "Some operation has been performed upon it; has it had a bad hare-lip?" The mother said, "No; that is the child from which you cut the tumour two years ago." From the growth of the child, the parts had become adapted to one another, and, every trace of the nævus being removed, the parts had accommodated themselves in such a way, that the deformity was almost entirely removed. There was little more mark upon the child's face than results from an extreme form of hare-lip. As this child you have just seen is only nine months old, if it recover, as it likely will, and be spared for two or three years, the probability is that, if you saw it again, you would find that the parts were nearly restored, and you would hardly be able to recognise it as the child on whom the fearful operation was performed.—*British Medical Journal*, June 26, 1875, p. 831.

46.—ON SCARLESS ERADICATION OF NÆVI.

By RICHARD BARWELL, Esq., Surgeon to Charing Cross Hospital.

It need scarcely, at the present day, be pointed out that nævus maternus should not be made the subject of operation unless some circumstance render interference necessary. Such circumstance may be rapid growth, inducing danger by hemorrhage; and such danger may be increased by position, as, for instance, at the mastoid process, where a nævus may, by growth in size and complexity, become a cirroid aneurism or aneurism by anastomosis. Position may, however, of itself be sufficient to call for operative measures, since, for instance, a female child of the upper walks of life, with a disfiguring nævus about the face, neck, or arms, should hardly be left thus marked; and here also it is of great importance to choose such operation as shall leave no scar behind—hence such as shall destroy no skin, not even that discoloured by the growth to be eradicated.

The mixed nævus therefore requires, if no scar is to be left, two forms of treatment, which may be carried on simultaneously—one for the skin portion and another for the subcutaneous. Subcutaneous strangulation of a nævus, effected by passing a string round the base of the tumour and tying it as tightly as possible, is a painful process replete with danger; it frequently fails in its purpose, as the tumour sloughs, and the slough either involves the skin and comes out by it, or it does not implicate the skin, and the dead morsel becomes a source of great danger. These inconveniences are due partly to the material used, but chiefly to the rapid and complete

strangulation, as it were, by a blow. A mixture of slow strangulation and of cutting avoids these contingencies, as I have tested by many cases and several years' experience.

The operation may be thus performed:—Having carefully made out the limits of the *nævus* both as to depth and circumference, a needle armed with not too fine a wire is passed through the skin, half round the tumour, and out again opposite the place of entrance; the needle is then again introduced at the same puncture by which it had just emerged, and, passing round the other side of the tumour, makes its final exit at the opening first made. In certain cases, large size or peculiar shape of the tumour may render it necessary to bring out the needle twice instead of only once. However that may be, the effect is to enclose the base of the tumour in a wire loop, both ends of which, emerging at the same opening, are under perfect control. These might merely be twisted together till the requisite tightness is attained, but in this practice certain inconveniences arise which I have obviated by another expedient. A vulcanite oval plate, about three-quarters of an inch long and an eighth of an inch thick, has two holes bored obliquely through its thickness; and on its external surface two little studs project close to where these holes emerge, and where also they are furthest apart. By bringing the end which passes by the right side of the *nævus* through the left hole, and *vice versa*, the wire is made to cross, while the oblique direction of the holes permits it to run smoothly. The surgeon, having thus arranged his appliance, draws upon the wires until the *nævus* is rather tense, and then twists each end round the nearest stud. A piece of lint, slit so as to bestride the wire, is introduced between the skin and the vulcanite button, and prevents any undue pressure by the edges of the plate.

On the third or fourth day the wire will have become somewhat loosened: one of the ends is to be untwisted from the stud, drawn tight, and again secured. This process is to be repeated until the wire comes away, when, as must be evident, it has not merely strangulated, but has cut through the base of the *nævus* with all its vessels of supply; in fact, it has acted like a slow and sure *écraseur*. During this procedure some pus forms and escapes by the needle punctures, but the treatment is so painless that, except at the time when the wire is being tightened, the child suffers no pain, is not fractious, and remains quite well.

Thus the subcutaneous part of the *nævus* will be destroyed, and in many cases the cutaneous parts will at once begin to shrivel and to lose their morbid colour. In other cases this change is either very slow or will not take place without some aid. The best means of effecting this is to brush the coloured

parts with strong nitric acid, leave it for a few seconds, and then to wash it off with an alkaline solution. Care must be taken not to leave on the acid long enough to destroy the skin or to produce ulceration. This had best be done while the wire is still encircling the base of the nævus.—*Lancet*, May 8, 1875, p. 642.

47.—ON THE TREATMENT OF CERTAIN FORMS OF VASCULAR ERECTILE TUMOURS BY GALVANO-PUNCTURE.

By Professor JAMES SPENCE, F.R.S.E., Surgeon to the Royal Infirmary, Edinburgh.

To the uses of galvano-puncture or electrolysis in certain forms of vascular erectile tumours I wish more especially to direct your attention as a most valuable addition to our means of treating these often formidable growths. I do not speak of it as a general method, you will observe; for there are many forms of nævi and erectile tumours—in truth, a majority of that class of diseases—in which other methods are more rapidly effective.

Galvano-puncture is specially indicated in those cases in which the erectile tumour is deep-seated and covered by healthy, undiscoloured skin. Until a few years ago, our interference in such cases was limited to dissecting off and reflecting the superimposed textures, so as to expose the tumour without touching it with the knife, and then strangulating it by strong ligatures, and, when the growth had sloughed and separated, replacing the flaps of skin; or by ligature of large arterial trunks indirectly connected with the growth, as, for example, ligature of the carotid artery for orbital erectile growths. The former method was attended with grave inconveniences and dangers; and the latter, besides entailing risk, was most uncertain in its effects, as you can readily understand from the nature of the disease. More recently, injections with the perchloride of iron took the place of these methods, and, in a great number of cases, answered very well, but in others a very considerable amount of sloughing took place before the rest of the tumour had been consolidated, and in such cases severe hemorrhage occurred, and the life of the patient was endangered. In some cases also the injections of perchloride were attended with a rapidly fatal issue, apparently from thrombosis. I must, however, say that I never saw such a result, though I have long used, and continue to use, the perchloride of iron injections, and I can only attribute such accidents to the neglect of tearing up the texture of the tumour before injecting the perchloride.

Contrast of the results of different methods is perhaps the most effectual way of impressing their comparative advantages, and shows what advance our science is making; let me, therefore, bring under your notice the following cases from my own practice. An infant, six weeks old, was sent to my care on account of a deep-seated pulsating erectile tumour, occupying the palm of the hand, and extending up to the wrist. The tumour had been growing rapidly, and at one point the skin was thin and discoloured. I used injection of perchloride of iron, and part consolidated. Again it was used, and the consolidation was followed by inflammation and the separation of a small central slough. From the ulcerated surface, bleeding took place, and though arrested by local application of the perchloride, it returned from time to time, and as the child's life was thus endangered, and the growth seemed rather to increase than diminish, I was forced to amputate in the fore arm, when the infant was eight weeks old. She made a very rapid recovery, but with the loss of a hand. I show you here the cast of the hand of an infant affected with deep-seated pulsating erectile tumour very similar to the former. In this case I applied electrolysis during three months while the child was under my care in hospital, and by several applications of the battery the growth began to consolidate and contract, whilst, except at the time of an application, the child suffered no irritation. As it was inconvenient for the mother to remain in hospital, I asked Dr. Connel, of Peebles, who had sent the case to me, to conduct the remainder of the treatment. As the child's parents lived at some distance from Peebles, the applications of electrolysis could only be made at long and irregular intervals. Here is a cast of the hand when the cure was completed; and, when you contrast it with this preparation of the amputated hand of my former case, you will, I think, agree with me that the result is a triumphant vindication of the value of electrolysis in such cases. I have used it also in other cases with advantage, especially in an enormous erectile nævus of the face of a girl. It is of importance that it should not be applied indiscriminately to all cases of nævus or erectile tumours. I think its use should be restricted to cases where the erectile growth is covered to some depth by healthy skin. The needles are coated to a certain length with a non-conducting material, which protects the healthy superimposed texture, whilst the uncovered points passed into the growth act on it at different parts. If needles be applied to a superficial erectile spot, they cauterise and leave more mark than other methods, such as application of nitric acid, perchloride of iron, or iodine. Thus, in treating the large erectile nævus of the face, the electrolysis was only used to the deep-seated portions, while the superficial

discoloured marks were treated by applications of perchloride, iodine, &c.—*Medical Times and Gazette*, Aug. 21, 1875, p. 209.

48.—HEALING OF WOUNDS BY BLOOD-TISSUE.

By JOHN CHIENE, Esq., Assistant-Surgeon, Edinburgh Royal Infirmary.

“The blood being alive, this uniting medium becomes immediately a part of ourselves, and the parts not being offended by it, no irritation is produced.”—(JOHN HUNTER, chapter on Union by the First Intention).

The organisation of an accidental blood-clot in open antiseptic wounds in Mr. Lister's practice and in cases under my own care, first suggested to my mind the propriety of trying to heal a recent open wound by filling, at the time of the operation, the cavity with blood, which would coagulate, become organised, and which in time would become covered with epithelium. The expectation was that less contraction would follow if the wound healed by blood-tissue than if it was allowed to granulate and heal by cicatrisation.

A young man suffering from a horn on the point of the heel was admitted into the surgical clinical wards in the Edinburgh Royal Infirmary in April last. The case appeared a suitable one for the experiment, because the situation and nature of the wound would which require to be made in order to remove the horny projection was such that union by the first intention was unattainable, and if the wound was allowed to granulate and heal by cicatrisation and contraction, like an ulcer, the result would be drawing up of the heel and deformity and lameness in walking. The horn had been removed twice previously, but had again grown. At one of these operations the healing of the wound was assisted by the organisation of an accidental blood-clot. The horn now projected from the surface to the extent of the third of an inch, consisting of layers of horny epithelium, and had a circular base nearly the size of a shilling.

On the 18th of April, 1875, a tourniquet was applied, and the horn removed; the resulting wound was triangular in shape, each side of the triangle being an inch and a quarter in length. The soft tissues down to the bone were removed, and the surface of the os calcis scraped with a periosteum scraper. The cavity was half an inch in depth. No vessels were tied. A piece of protective was placed over the opening in order to close it, and the usual antiseptic dressing applied. The tourniquet was then removed. The expectation was that blood pouring from the sides and floor would fill the cavity. The

operation was performed under a spray of carbolic acid. On the following day the wound was dressed, and it was found that, with the exception of a shallow depression at one corner, the entire cavity was filled with dark clot. This was not disturbed, and the dressing carefully reapplied. On the sixth day the clot was of jelly-like consistence, and still of a dark colour. On the twelfth day the clot was of firmer consistence, and of a dark-brown colour. The clot did not bleed when scratched. On the sixteenth day the superficial portion of the clot, which corresponded to the depth of the thickened horny epithelium of the heel, liquefied, and came away in the discharges. The surface of the clot was now on a level with the deepest layer of horny epithelium. It bled when scratched at its centre, and the escaping blood filled a slight groove on the surface of the original clot. On the twenty-sixth day the original clot was distinctly vascular, and on its surface the secondary clot (the result of the scratching of the original clot on the sixteenth day) was observed of a dark colour, and adherent to the original clot. This secondary clot passed through the same changes as the original clot; the changes were, however, more rapid, in consequence, I presume, of its smaller size. On the thirtieth day the sharp-defined edges of the original wound in the horny epithelium had disappeared, and an epidermic formation was observed on the surface of the clot at its edges. On the thirty-fourth day the wound was healed, the blood-clot being entirely covered with epithelium. The triangular wound was still distinctly marked, and no contraction had taken place. No attempt was made by bandaging or splints to prevent contraction during the cure.

The patient was shown at the June meeting of the Medico-Chirurgical Society of this city. It has yet to be seen whether contraction will take place. The practical value of this method of healing wounds by blood-tissue has yet to be tested by further experiment. The case is, however, worthy of record: first, because, as far as I am aware, it is the first in which a systematic attempt has been made to utilise blood as a tissue for the filling up of an open wound. At present it seems to verify the quotation from John Hunter with which this short paper is headed. Secondly, because it is a practical lesson, teaching the slight amount of irritation in wounds treated antiseptically; it is a visible picture of the unseen changes which take place in a subcutaneous blood-clot as in a simple fracture.—*Lancet*, July 10, 1875, p. 47.

ALIMENTARY CANAL.

49.—ON A SLIGHT MODIFICATION IN THE OPERATION FOR CLOSING FISSURES OF THE SOFT PALATE.

By EDWARD BELLAMY, Esq., Senior Assistant-Surgeon to Charing Cross Hospital.

Those who are in the habit of operating upon these cases, are aware how important is the passing of the first suture, and that its disposition with regard to the edges of the cleft and to the limit of the extent of the fissures, are of the first moment to the subsequent steps. Now it very frequently happens that the processes of freshening the edges of the cleft, and of dividing the muscles, in the hands of inexperienced operators, render the subsequent passing of these sutures a matter of considerable difficulty, even although the patient be chloroformed, and the parts distended by means of the gag.

I have found that the primary introduction of a silver wire suture in the following manner is a great auxiliary to success in the more important steps of the operation, before the edges be freshened, and the myotomy performed. A needle armed with stoutish silver-wire should be introduced at a point rather less than midway between the apex of the cleft and the free uvular margin of the velum, taking care that it transfixes the tissues at some distance from the edges of the fissure, and that the point of its introduction on the opposite side exactly corresponds with it. The ends of this wire are now to be brought out of the mouth, and the loop left loose behind the velum. Next comes the division of the muscles, and then the paring of the edges of the cleft. The object then, of passing the wire suture thus early, is, that though *in situ*, it runs no chance of being divided by the knife during this portion of the operation, whilst, by giving it a good hold of the palatal tissues I have alluded to, as soon as the V is removed, it can be immediately tightened, thus approximating the edges at once, and giving the patient a little breathing time (if without chloroform); and, moreover enabling the surgeon to clear the mouth entirely of clot, and to exactly adjust his remaining sutures without undue hurry and with greater nicety.—*British Medical Journal*, June 12, 1875, p. 772.

50.—ON THE TREATMENT OF HERNIA BY INVERSION.

By Dr. J. H. THORNTON, B.A., Surgeon-Major, Indian Medical Service, Civil Surgeon of Shahabad.

This mode of treatment, though mentioned in most surgical works, has never, so far as I know, been considered on its own

merits, but merely as an aid to the taxis and the other measures usually employed in the reduction of hernia. My object in this paper is to draw attention to the efficacy of inversion alone, not only in reducible hernia, but also in many cases where the rupture has become strangulated, and to suggest that a fair trial should be given to a plan of treatment which possesses so many advantages and is attended by so little risk.

The treatment of hernia by inversion consists in placing the patient in such a position as to bring the force of gravity into play to reduce the rupture. This may easily be effected by raising the foot of the patient's bed, and keeping it supported at an angle of 45°. In this posture the intestines naturally gravitate towards the upper part of the abdominal cavity, and gradually draw in the ruptured portion. It is evident, from the nature of the case, that a force acting gradually and equally from within the abdomen must be far safer and more effectual than any pressure applied externally. The use of the taxis, however carefully applied, must almost always involve some bruising of the parts, which would have an injurious effect should the attempts at reduction be unsuccessful and an operation become necessary. Sometimes violent manual pressure is employed by the patient and his friends in repeated fruitless efforts to reduce the hernia, and in such cases very serious results are likely to ensue. Contusion of the tissues, extravasation of blood, congestion, inflammation, and even gangrene of the ruptured bowel may result from violent, protracted, and ill-applied manipulation. The various other measures sometimes resorted to, such as bleeding, the inhalation of chloroform, hot baths, purgatives, enemata, cold, &c., are all liable to the objections that they are uncertain in their operation, not suited to every case, and often attended with risk. The advantages of inversion over all these modes of treatment are, that it is generally effectual, absolutely safe, and universally applicable. It can be used by any person, at any time, and in any place; and should it prove unsuccessful in effecting reduction (which will rarely be the case unless adhesions have formed), the patient is in a more favourable condition for the performance of the necessary operation than he would be after the employment of the other methods. The following case illustrates the efficacy of this mode of treatment.

A man named Dhoree, aged forty-two, was admitted into the Charitable Dispensary at Arrah on December 4th, 1873, with strangulated hernia (oblique inguinal, right side). The rupture had frequently appeared before, and he had been able to return it without difficulty. On this occasion, however, he was unable to do so; and his friends, who made repeated attempts to reduce the hernia, were equally unsuccessful. The result of

their interference was that severe pain set in during the night, and, finding him getting worse, they brought him to the dispensary early in the morning. The assistant-surgeon saw him, and endeavoured to reduce the rupture by the taxis, with the assistance of chloroform; but his efforts were unsuccessful. I saw the patient at 9 a.m., about thirty hours after the appearance of the rupture. He was in great pain and distress, the bowels had not acted since the hernia appeared, there was much prostration, and hiccough and vomiting had already set in. I ordered the foot of his bed to be raised and supported at an angle of 45° , and I directed that he should be allowed to remain in that posture, and that no further attempts should be made to return the rupture. The result was that in about twenty minutes the hernia disappeared, reduction having taken place spontaneously. The patient speedily recovered. In this case the taxis, aided by chloroform, had failed, urgent symptoms had set in, and inversion was tried as a last resource, failing which an operation must have been performed to save the life of the patient. The success of the treatment by inversion under such circumstances is a satisfactory proof of its value, and shows that it might be advantageously employed in most cases of strangulated hernia, before resorting to an operation.—*Lancet*, August 14, 1875, p. 243.

51.—CASE OF LONG-STANDING FISTULA IN ANO TREATED BY THE ELASTIC LIGATURE.

By Dr. J. C. OGILVIE WILL, Assistant-Surgeon to the Aberdeen Royal Infirmary.

Among other purposes for which an elastic ligature may be employed, Professor Dittel mentions that of division of the tissues for the cure of fistula in ano; and though I do not consider that, as a rule, its use should be preferred to the cutting operation, in certain exceptional cases I think it may prove of advantage, of which the following is a well-marked example. The history of this case is reduced from a written statement supplied by the patient, and it certainly appears a very extraordinary one.

W. P., aged fifty-one, states that in the summer of 1854 he suffered from great weakness of his back and legs, and severe pain after being at stool. He was then treated for "spinal disease" by the actual cautery, blisters, and the application of leeches round the anus. After being subjected to this treatment for eight months he attempted to resume his duties; but the pain after defecation continued, and even at other times he suffered so much uneasiness that, frequently after returning

home at night, he applied leeches and poultices to relieve it. He continued in much the same state till August, 1864, when matter was observed issuing from an opening by the side of the anus. This discharge went on for eighteen months, during which period he had no pain at stool, but a feeling of great weakness and pain in the small of his back. During the next four years "red swellings" appeared from time to time round the anus, but with the aid of leeches and poultices they were got rid of. From 1870 to 1874 there was an occasional discharge of pus from a sinus, the flow sometimes continuing for three months, then stopping, and then again commencing; at times he could neither sit nor lie, but was obliged to walk about, which he found afforded greater relief than anything. In September, 1874, the pain while sitting increased, especially at one point on the inner side of the left buttock, where he could feel "something about the size of a pea, from which a hard cord extended to the anus." This swelling gradually increased, as did the pain; and he had again recourse to leeches and poultices, but, finding them of no avail, he applied to a medical man, who soon after requested me to see him.

On examination, I found a small opening in the perineum on the left side of, and distant two inches from, the verge of the anus. On introducing a probe, it revealed an indurated, deeply-seated sinus, ending some little distance above the sphincter; but no internal opening could be detected. The lower part of the gut was separated from its surrounding structures to such an extent that the point of the probe could be swept round fully half its diameter.

Some days afterwards I completed the fistula by making an internal opening in the gut above the sphincter, and passed in a probe armed with a solid elastic ligature (similar to that described by Sir Henry Thompson in the *Lancet* of Jan. 3rd, 1874), which I then, after detaching it from the probe, put tightly on the stretch and knotted securely. The ligature was considerably larger than the eye of a probe would admit, so I fastened them together by means of a thread of iron wire. At the moment when the ligature was being tied, the patient complained of considerable pain; but this soon passed off, and by the use of morphia suppositories he was kept quiet and comfortable. A pad of lint coated with an ointment containing salicylic acid was applied, and retained by a T bandage.

The ligature came away on the eighth day of the operation, and left a broad but healthy granulating surface, which gradually healed. The bowels were moved some days before the separation of the ligature, but its presence did not occasion any inconvenience.

In this case, on account of the length and depth of the

fistula, considerable hemorrhage would, in all probability, have followed the use of the knife; moreover the patient was weak from long suffering, of extremely sensitive and nervous temperament, the subject of heart disease, and much averse to a cutting operation; therefore I think it was a peculiarly suitable case for the employment of the elastic ligature, as not one drop of blood was lost during the entire proceeding, and the shock of the operation was much less than it would have been had division by a cutting instrument been the mode adopted.—*Lancet*, August 7, 1875, p. 205.

52.—CASES ILLUSTRATING THE TREATMENT OF HÆMORRHOIDS AND PROLAPSUS BY THE CLAMP AND CAUTERY.

By HENRY SMITH, Esq., Surgeon to King's College Hospital.

[Pyæmia is well known to occur after operations upon internal hæmorrhoids. Mr. Smith has not met with a case which could be verified as such after this series of operations.]

Pyæmia after the use of the cautery is most unlikely to occur; it is odd, however, that I have not met with any cases, for it is often necessary to make extensive wounds in the integument, to which the cautery of course is not applied.

Erysipelas is a complication of which I must speak. In the 300 cases I had not one instance; but, curiously enough, in the last 100 I have had two—at least one of the cases was decidedly a well marked instance of the disease, spread over the whole of the buttocks and back, and nearly killed my patient. I may mention, however, that he had been terribly reduced by his disease, consisting of a huge prolapsus, and that I had to make extensive incisions for removing external tumours. Erysipelas was, moreover, very rife in my practice at this period. At this very time, and in the same neighbourhood, another gentleman got rigors, fever, and a large abscess in the buttock, from which he recovered although he was seventy-eight years old. I believe I took the erysipelas from my other patient to this. It has been a matter of surprise and congratulation to myself that I have not much more frequently met with erysipelas after this operation. I believe that the immunity is due in great measure to the action of the cautery—an explanation similar to what holds good in instances of burns; however extensive these are, it is a comparatively rare thing to find erysipelas attack such a wound.

I come now to the consideration of hemorrhage—the most important matter in connexion with the operation of the

clamp and cautery. Important in two senses; first, because it is in reality the only objection to the operation; and, second, it is the result against which the surgeon has most to guard, and unless he takes very great care it is an occurrence very likely to take place. I find, moreover, from what has been written, and from conversation with my professional brethren, that surgeons dread the performance of the operation from fear of this taking place. But I have no hesitation in saying that the bleeding which is most likely to be serious—viz., that which may take place immediately after the operation—ought not to occur, and that if it does happen it is either from the fault of the operator or from the use of defective instruments or an inefficient use of the cautery. As to my own results, I may state that in the whole of my 400 cases, which have included many of the severest kind and of huge size, I have never met with bleeding sufficient to necessitate plugging of the rectum; and not one of the house-surgeons of King's College Hospital have ever had to resort to that measure. In fact, I have been astonished that a case has never occurred to me where this measure has been needful, as, especially in hospital cases, I have frequently been very sparing with the cautery, and have become emboldened by success from paying as much attention as I ought to prevent its occurrence. I have met with eight cases in which bleeding, either immediately on the operation or that which may be termed secondary hemorrhage, has taken place to such an extent as to demand very active measures short of plugging the rectum; and, curiously enough, at least six of these have occurred in my last series. I account for this—and glad I am, in one respect, to be able to say this—from my previous immunity causing me to take less precautions than I should. This little salutary experience, which I will relate, has made me doubly careful, and I do not think that my future results will show any similar mishaps.

The first case occurred in the person of a young woman in most miserable health, who had suffered terribly from hemorrhage and came into the hospital with severe hemorrhoids. I performed the operation with the clamp and cautery. A few days after she got pain in the pelvic region, with constitutional disturbance, and the action of the bowels was followed by smart bleeding, and it recurred on two occasions. It was arrested on each occasion by the injection of iced water, and she got quite well. I cannot take any blame to myself in this instance. Either some vessel must have escaped the action of the cautery, or the blood was in such an impoverished state that there could

not have been coagulating power enough to close thoroughly the vessels. I have operated on many such cases, however, and have not had any bleeding; in fact, it is in such cases as this that I believe we find the special advantages of the cautery. I once saw, in a similar case, where ligature was employed, nearly fatal secondary hemorrhage ensue after the separation of the threads.

The second case occurred in a hospital patient, a man. Smart bleeding occurred after the action of the bowels, which, however, was stopped by the injection of iced water. In hospital cases I am not so particular in applying the cautery, as I know there is assistance handy if bleeding should occur. I think it very probable I did not cauterise sufficiently here. Both these cases were examples of secondary hemorrhage proper, which is very rare indeed.

Sometimes a good deal of blood is passed on the first action of the bowels. The patient gets alarmed, and I am sent for; but on examination it is found that the greater part of this evacuation consists of dark coagulated blood, which had evidently slowly escaped into the bowel after the operation, and had remained there until the action took place. The third and fourth cases were of this description. In the one the bleeding ceased spontaneously; but in the other some arterial blood was poured out, and my assistant, who was called to the case in my absence, was obliged to pass a large speculum into the bowel, screw it up, and allow it to remain until I arrived. This answered most effectually. Now in both these cases I take blame to myself. In each there was a mass of internal hemorrhoids, which I clamped and cauterised in the ordinary manner; but, in addition, there was a large mass of external growths, covered partly by mucous membrane. I removed them with the scissors, but did not apply the cautery to the bleeding surface, as I have done since in instances where the muco-cutaneous growths, as I would term them, are very large. When the cut parts are returned after the operation, of course the wounds which were external become converted, as it were, into internal, and vessels which have been divided and have not been cauterised are very liable to bleed. Many years ago I saw a nearly fatal case of hemorrhage from this cause.

The fifth case was an instance of bleeding coming on immediately after the operation, and, excepting the last case I shall mention—which, however, is not exactly similar,—it is the only instance of the kind I have met with, although I have been constantly expecting it, and have wondered at its non-occurrence. I operated on a gentleman for large internal

hemorrhoids. In clamping the largest tumour, and after dividing it and cauterising, a portion of the cut pedicle slipped away, and on unscrewing the instrument I noticed a vessel bleeding freely; it retracted, however, and apparently ceased to bleed. I finished the operation, and returned the parts. In about ten minutes, just as my assistants and myself were about to take our departure, the patient suddenly called out that his bowels were about to act; and immediately a large gush of blood took place, making him very faint. I at once introduced a large silvered glass speculum into the rectum, when another large gush of blood took place, and the bleeding continued for some moments, but by pressing the speculum well in I stopped it very quickly. The speculum was retained for about a quarter of an hour, and the bleeding did not recur. This might have been a serious case if I had left the house; and doubtless I was very blamable, in the first place, for allowing a portion of the pedicle to slip, and, in the next place, for not applying the clamp again and cauterising the vessel, which of course had not been touched at all by the hot iron.

The sixth and last case was one of a peculiar character. It occurred last July, in the person of a gentleman who suffered severely from internal hemorrhoids; one was a large solid growth, more like a polypus, and having a thick solid pedicle. Before putting on the clamp I made a free incision around its circumference, and in doing so I wounded a large vessel; it spouted forth its contents over me, and then retracted, and, as I supposed, ceased to bleed. I embraced the tumour with a large clamp, inserting the blades into the cut surface, and removed the growth, freely cauterising the pedicle. In about an hour the patient felt very faint, and was obliged to resort to measures to relieve this; shortly afterwards, however, this condition passed away, and he felt pretty well until about forty-eight hours after the operation, when he had a strong desire to evacuate the bowels, and he passed a large quantity of coagulated blood. He made a very quick recovery. Now in this case there was a very narrow chance of the patient having a serious hemorrhage, and I was much to blame; for there can be no doubt that the large vessel which I had divided, and which had apparently ceased bleeding, burst out afresh on the completion of the operation, but was arrested by two causes—namely, the fainting, and the coagulation of the blood acting as a plug. I ought not to have trusted to the powers of nature to arrest bleeding from so large a vessel, but should have drawn the part down and have clamped and cauterised that as well as the rest of the pedicle.

It is a somewhat curious circumstance that in the majority of the cases where bleeding occurred it happened in the last series

of operations, and I have no doubt is entirely explained by the fact that repeated operations at an earlier period of my practice without any hemorrhage occurring had made me bold and somewhat careless; for when I first began to perform this operation I had a constant dread of hemorrhage, and used to apply the cautery so freely that bleeding could not take place. I have, however, since the occurrence of the cases I have detailed, returned to my former method of free cauterisation, and I do not believe I shall get any further cases of bleeding.

One other point in reference to the result of this operation, about which I have often been questioned, is as to the liability to the occurrence of stricture. My experience shows that stricture is not likely to occur from clamping and cauterising mucous membrane, but it is just as likely to occur after this operation as after any other operation when the skin is too freely dealt with. I have had three cases where, from this cause, cicatrisation of the skin caused a contraction of the anus; and hence I am extremely careful about the removal of skin, and only adopt this measure where there is an abundance of this tissue, or where, in consequence of great weakening of the sphincter, it is necessary to produce firm cicatrisation. If, however, I am obliged to remove skin at all freely, I always make a patient use a bougie for a few weeks.

In one instance only have I met with a case where a fistula resulted. In this case I had not the charge of the after-treatment, and therefore do not hold myself responsible for the result.—*Lancet*, July 24, 1875, p. 124.

53.—ON THE TREATMENT OF HÆMORRHOIDS, AND THE COMPARATIVE MERITS OF THE OPERATION BY THE CLAMP AND BY THE LIGATURE.

By JAMES R. LANE, Esq., Surgeon to St. Mary's Hospital.

The result of Mr. Smith's experience of 400 cases forms, without doubt, a very valuable contribution to practical surgery; and when we learn that out of this number he has only met with four deaths, it will, I trust, help to allay the vague apprehension which exists, even in the profession; respecting the risks attending operations for this disease. But I contend, at the same time, that he has not yet succeeded in demonstrating the superiority of the clamp and cautery over the ligature; and I do so on the following grounds. I have myself operated with the ligature, at St. Mark's Hospital and elsewhere, on more than 800 cases, with only three deaths; while Mr. Allingham, in his book published in 1871, states that he had then operated on 400 cases, without any death at all.

With respect to pyæmia, no death from that cause has occurred in my experience, and Mr. Allingham states that 3210 cases in St. Mark's Hospital have not furnished a single example of it, though he refers to four cases of death from that cause in the practice of other surgeons after the operation with the clamp and cautery. I have no desire to maintain that the ligature possesses in this respect any peculiar advantage over the clamp, for I believe the tendency towards pyæmia will, in the long run, be found to be about equal in both; but the facts which I have stated effectually dispose of the peculiar immunity from pyæmia formerly claimed for the clamp by Mr. Smith, and also of his recently expressed opinion that "the complete sealing up of the vessels produced by the hot iron is the very best safeguard against pyæmia we can have." I am quite at a loss to see how vessels are more completely sealed up by cautery than by ligature; in fact, if the argument is worth anything, the ligature ought to be superseded by the cautery in surgical operations wherever practicable, in order to diminish the liability to pyæmic infection.

The most serious objection to the operation with the clamp is its liability to be followed by hemorrhage. Mr. Smith himself now candidly speaks of this as "the result against which the surgeon has most to guard, and unless he takes very great care it is an occurrence very likely to take place." He mentions cases in which it took place to a rather serious extent immediately after the operation, and others in which it occurred a few days afterwards, when the bowels were relieved. In the latter it probably arose from the vessels being re-opened in consequence of the slough being detached or disturbed during the passage of the fæces over the wounded surface—an indication that they are not so efficiently closed by cauterisation as when they are securely embraced by a ligature. A lesser degree of hemorrhage seems to be not unfrequent, for we are told that "sometimes a good deal of blood is passed on the first action of the bowels, and on examination it is found that the greater part of this evacuation consists of dark coagulated blood, which had evidently slowly escaped into the bowel after the operation, and had remained there until the action took place," another indication that all the divided vessels are not completely closed by the cauterisation.

Were it not for the danger of hemorrhage there would probably be little to choose between the two modes of operation; they are, in fact, only different ways of doing the same thing. From what I have seen I believe them to be as nearly as possible equal as regards the danger to life, and also as regards the ultimate result, the subsequent pain, and the time required for recovery; and I have seen nothing to justify the assertions

that the method with the clamp is in any of these points superior to the other. But the danger of bleeding, which is confessedly a real one, is sufficient, in my opinion, on Mr. Smith's own showing, to justify the condemnation of the operation with the clamp in all cases where the disease is far advanced and large vessels are involved. One of the fatal cases which he records is significant. It is that of an elderly gentleman with very severe prolapsus. A very vigorous application of the cautery was necessary to arrest the bleeding, and the patient died on the fifth day from peritonitis. Mr. Smith does not doubt that the peritonitis was produced by the excessive employment of the cautery, and thinks it possible that he may even have injured the peritoneum. Surely in any case where there is a chance of such severe cauterisation being required, the operation with the ligature must be the safer of the two. I have myself never hesitated to use it in the most extensive cases of disease, and I have never yet had occasion to repent having done so.—*Lancet*, July 31, 1875, p. 162.

ORGANS OF URINE AND GENERATION.

54.—VARICOCELE, AND ITS CURATIVE OPERATION BY SUBCUTANEOUS WIRE LOOP.

By RICHARD BARWELL, Esq.; Surgeon to Charing Cross Hospital.

The mode of operating on nævus by subcutaneous wire loop, which I advocated in a former paper (p. 198), is, with certain modifications, also applicable to the curative operation for varicocele, and is, I believe, the safest means of destroying the varicose veins at this part. Before, however, describing this method, it would be well to say a few words concerning the malady, and the motives which should cause us to operate or to abstain.

The veins of the lower part of the cord may become varicose from a number of causes, and yet the disease is rarely seen on the right side. When we consider that the malady may follow a blow, of which causation I have seen two examples, and that it may very commonly be traced to evil habits in youth, it would seem strange that such occurrences, which certainly ought to affect both sides, only produce varicocele on the left, rarely on both, hardly ever on the right alone; I say this would seem strange did we not take into account the predisposing causes, of which there are two: one, the termination of the spermatic vein, usually held to be all-sufficient; the other,

and in my belief the more important, being the position of the lower part of the colon across the vein, which intestine, being in careless youth often overloaded, affords a marked obstacle to the return of venous blood.

Whatever the immediate cause may be, we find within the scrotum of a person thus affected the enlarged veins, aptly compared to a bunch of earth-worms, extending from the testicle upwards, the scrotum on that side lax and long, the testicle smaller and softer than the other, and often the seat of sharp, lancinating, more or less frequently recurrent pains, as well as of continuous aching, sometimes dull, sometimes severe.

Now, these two points—the flabbiness and smallness of the testicle, and the frequency or severity of the pain—should cause us to recommend or withhold operation. There is no doubt that a slight or moderate degree of varicocele may be kept in abeyance, may even be improved, by the use of a suspensory bandage or of a truss, and under such circumstances the malady will be painless. The testicle will hardly diminish in size. Nevertheless I believe that cure of this complaint by such means is excessively rare, nor do I think that the testicle from which the varicocele springs is of much use. But as long as the organ retains a certain amount of hardness and of size, I do not feel justified in recommending an operation, and if no very palpable difference in the two organs be present, I should even strongly dissuade a patient from such procedure, unless he were suffering much pain. On the other hand, if the testicle of the affected side be markedly small and soft, particularly if the diminution have been rapid and be still going on, I should recommend obliteration of the veins, even though the accompanying pain were trivial; *a fortiori*, I would strongly recommend it if the pain be pretty severe. Even considerable pain alone (neuralgia being eliminated) is sufficient justification for operation by a method which, in my experience, is free from danger.

I cannot say that freedom from danger is the quality of every operation for varicocele. The plan of passing two needles beneath the veins, the one a short distance above the other, casting round each a figure-of-8 ligature, and dividing the vessels between them, has not infrequently been followed by pyæmia and death. Ricord's subcutaneous ligature is in many ways imperfect; pyæmia has resulted from it, and return of the disease also occurs. Other methods might also be named, such as Tufnell's substitution of wire for the thread which Ricord uses, and this is doubtless the best that has hitherto been described. Among the objections to it is complication.

The method which I adopted several years ago, and which I have very frequently used, is as follows:—First, it is most important that the vas deferens and spermatic artery be separated from the veins. This is best done by the surgeon standing on the patient's left (supposing the disease to be on that side), and taking that half of the scrotum, about an inch above the testicle, between the left finger and thumb, and feeling for the duct by rubbing the two surfaces of the bag gently together while its walls glide from his grip. When he has thus brought the duct and artery from among the venous plexus and holds them between his thumb and finger-tip, he must let them slip away to the back, so that he will enclose the veins within the circle of his finger and thumb and exclude from it the artery and the vas deferens. The digit tips and slightly compressed scrotum will separate the one set of vessels from the other. If, in seeking for the duct, the surgeon have allowed a few veins to slip away with it, he can begin again, with the advantage of having no longer the whole mass, but only a few vessels, to deal with. If he be not sure of having successfully isolated this important part, he must examine the condition of things with his right hand while keeping the left in the same position. Supposing this separation accomplished, the bit of scrotum between the finger tips is to be squeezed rather tight, and a needle, armed with iron or silver wire, not too fine, thrust straight through above them. Now the part may be released from grasp, and the needle passed in again at the puncture of exit, in front of the veins, and out at the first place of entrance. Thus at one opening protrude the two ends of the wire, and at the other a loop; by drawing on the ends the loop is pulled into the scrotal cavity, and closely surrounds the varicocele. Each end is passed through a hole in the little instrument I depicted in my former paper, and drawn tight enough to make the veins below swell, bulge, and partly consolidate. Every other day, or every day if time be an object, the wire may be tightened until it has cut through all the consolidated veins, and has come away. No suppuration nor apparent inflammation accompanies the process. The patient need not be confined to his bed after the first forty-eight hours.

One caution must be given. In passing the needle the second time—i.e., in front of the veins,—its course must be entirely in the cavity of the scrotum. If, from over-anxiety to include every vein, or from other cause, some of the lining fascia be strangulated in the loop, the case will be considerably retarded, and some amount of suppuration, accompanied by swelling in the walls of the sac, is likely to ensue. The operation, well performed, is very slightly painful. I have several times completed it without any anæsthetic. Neither is

it followed by pain; indeed, where aching of the testicle has previously been pretty severe, relief is the immediate result.

Rather than give the details of any one case, I prefer to offer here an analysis of my results. I have operated on thirty-two cases. Not one has been followed by shiverings, erysipelas, or other dangerous symptom. Three had some suppuration: the pus found its way out of the first puncture in two of these; in the third, a small abscess formed in the walls of the scrotum, an opening a third of an inch long emptied it, and it rapidly healed. In every case the testicle has begun to resume its size and hardness soon after operation. Those that returned to observation after a year or more were found to have quite recovered normal condition, except one. Two cases I saw after five and after seven years. The former had, through bad habits, a double varicocele; the testicles, previous to operation, were very small and soft; he was pretty nearly emasculate; now the organs are firm, healthy, and very good. The other, seen after seven years, had become the father of two children, stated to be strong and healthy. The one case referred to above, which after two years had not recovered normal condition, was one of left varicocele; the testicle was at the time of operation quite flabby; it was at the end of two years certainly better, but still very soft, and the patient believed it to have regained function; the man was a very feeble person, of phthisical history. Although I have asked all my patients to call upon me in case there were any return of the disease, I have never seen one of them with such complaint.—*Lancet*, June 12, 1875, p. 820.

55.—ON A NEW URETHROTOME FOR INTERNAL URETHROTOMY.

By Dr. PATRICK HERON WATSON, F.R.S.E., Senior Surgeon to the Royal Infirmary, Edinburgh.

I have no wish to enter into any consideration at present of the advantage of one method of treating stricture of the urethra as compared with another. I believe that dilatation, divulsion, external and internal urethrotomy, have each their separate sphere, and form an efficient armoury, from which a skilled surgeon will, according to circumstances, select his appropriate weapon. I wish at present merely to direct attention to a new instrument which two years ago I had constructed for the internal division of strictures of the urethra. It has seemed to me much more satisfactory than any other form of instrument, intended to effect internal urethrotomy, with which I am acquainted.

The original instrument I had constructed for me in Paris, under the direction of my former resident surgeon, Mr. C. W. Macgillivray, by Luer, of Paris, but as its size was too large for the treatment of very tight strictures, I had a modified instrument, upon the same principle, constructed by Mr. Young, of this city. It consists essentially of a Syme's stricture staff, from which a tenotomy blade is made to protrude at an angle on turning from left to right a wheel fixed at the proximal extremity of the instrument. This instrument is probe-pointed at the distal extremity, and the size of a No. 10 or 12 at the haft. The instrument gradually increases for four inches from the fine probe-pointed extremity, up to the size of a No. 2 bougie. Here it abruptly enlarges to the size of a No. 12. At this point, where the thick and thin portions of the instrument are continuous, a tenotomy knife-blade, concealed in a groove in the slender part of the shaft, is so pivoted that it can be projected at an angle with the commencement of the thick portion of the staff. The degree of angular projection of the knife is determined by the number of turns given to the screw attached to the handle of the instrument, and this degree of protrusion is marked by an indicator on the shaft. For the purpose of cleansing the instrument after use, the blade can be screwed out to a right angle to the shaft; but in use, when dividing a stricture, no protrusion beyond an angle of 45° is required. The instrument in all its parts, except the blade, is nickelised to prevent rusting.

When employed the instrument is introduced with the blade enclosed in its groove. When the pointed extremity has been insinuated through the strictured part of the canal, it glides smoothly onwards towards the bladder, till the anterior extremity of the stricture arrests the progress of the thick portion of the staff. The anterior extremity of the stricture is thus determined with absolute precision, and as few strictures exceed an inch and a half in length, the blade is sufficiently long to secure the division of the stricture with one movement of withdrawal of the whole instrument. When once the instrument has been lodged in close contact with the stricture, the screw in the handle is turned so as to secure a protrusion of the blade to an angle of 30° , the whole instrument is then drawn forward as if to withdraw it from the canal. When this is at first attempted it is felt to be firmly held, then the tissues yield. When the instrument has been withdrawn about two inches from the urethra, the screw is inverted, causing the blade to retreat completely into its groove, and the passage of the whole instrument onward towards the bladder is once more attempted. In most instances this is found unopposed. And if it be so, the urethrotome is withdrawn, and a full-sized

catheter passed to empty the bladder. Should the passage onwards of the thick portion of the instrument be opposed, either another stricture or some portion of the same stricture is shown to be undivided. A reprotrusion of the blade, and repetition of the movement of withdrawal, will secure the division of this obstruction, and similarly of any other constriction which may still oppose the passage of the full-sized portion of the stem of the instrument.

I have never encountered any troublesome hemorrhage in the use of this instrument, while by means of it the extent of tissue divided has always been completely under control.

The advantages which this instrument has seemed to me to present are:—1. It determines accurately the anterior aspect of the stricture, while the shaft has been insinuated through the contraction. 2. It divides the stricture from behind forwards. 3. It enables the operator, by the abrupt shoulder on the shaft, to determine whether, by the use of the cutting apparatus, the stricture has been completely or only partially divided, and admits of his completing the division if need be, without any change of instrument, by merely repeating the same steps of operative procedure, as in the first instance. 4. It limits the section of the urethra to the part or parts which are actually contracted, and does not “promenade” the whole canal. 5. Its use is attended by remarkably little pain or bleeding.

As the arrangement of the wheel and screw admits of no yielding of the blade, even in fibrous, cartilaginous, or resilient structures, in which cases I have chiefly employed it, the section of tissue is effected with absolute certainty, the gradual angle or wedge-forming position of the knife to the stem of the instrument securing that the cutting edge will act against all tissues with which it is brought in contact as the instrument is withdrawn. Neither have I found any difficulty in retiring the blade within its groove when the section is complete, the fitting of the parts securing them against the possible interposition of any portion of the surfaces of the divided soft tissues.

For strictures situated in the anterior portion of the urethra, an instrument constructed precisely in the same manner, but shorter and quite straight, is made, I find myself, however, that the ordinary curved instrument is quite sufficient for every purpose.

The cutting-blade has its edge turned towards the floor of the urethra, but it may be constructed to act upwards if so desired, or to work with a double-edged knife, both upwards and downwards. I prefer myself that the incision should be made only in one direction, and that downwards or towards the floor of the canal.—*Lancet*, Oct. 28, 1875, p. 585.

56.—ON THE TREATMENT OF CERTAIN CASES OF STRICTURE OF THE URETHRA BY A COMBINATION OF EXTERNAL AND INTERNAL DIVISION.

By THOMAS ANNANDALE, Esq., F.R.S.E., Surgeon to the Edinburgh Royal Infirmary.

Cases of stricture of the urethra, complicated with numerous fistulous openings, and great thickening of the perineal and scrotal tissues, are well known in the experience of practical surgeons. There is also little doubt that the recognised treatment of this condition is a free external division of the perineum and strictured portion of the urethra. The difficulty of thoroughly dividing the entire strictured portion of the canal in these cases is only recognised to its full extent by those who have performed this operation. I have witnessed this difficulty in the hands of the most skilful operators, and I have myself experienced it on several occasions. Especially is this difficulty met with when the stricture is a tight one; for the accurate division of the affected part of the canal on Mr. Syme's staff, or without it, at a depth of from three to four inches (the increased depth depending on the thickening of the perineal textures), is a proceeding not easy to accomplish.

Another difficulty in such cases is the fact that a considerable extent of the urethra is often involved, or several strictures may exist, and experience shows that unless the whole urethra be properly dilated, a good result cannot be expected.

A few weeks ago a patient was admitted into my wards suffering from an aggravated form of this condition. His name was G. M. B., and he was 45 years of age. He had suffered from stricture of the urethra for four years, and about eighteen months before his admission abscesses formed in his perineum, buttocks, and scrotum, and gave rise to numerous fistulous openings in these situations. An examination determined the existence of a tight stricture of the urethra in the region of the bulb and anterior to it. The stricture was nearly two inches in length, and in addition there was a stricture, not so tight, in the anterior part of the urethra, about two inches from the meatus. There were five or six fistulous openings in the perineum, and several others in the buttocks, close to the anal orifice. The whole perineal textures were much thickened, and several hardened nodules of skin and cellular tissue were scattered through this region, resembling somewhat in appearance those occasionally met with in cancerous disease. The whole of the urine was passed through the fistulous openings. With some difficulty a No. 2 metal catheter could be passed through the stricture into the bladder.

In considering the treatment of this case, I knew that it would be necessary to freely incise the middle line of the peri-

neum, and also to divide the strictured portion of the urethra, in order to obtain a cure of the affected parts; but I also knew from experience something of the difficulties in successfully carrying out this proceeding. I was therefore glad to avail myself of a hint which I received in reading some very interesting papers on stricture of the urethra, by Professor Otis, of New York, for his suggestion seemed to me to be one likely to be very valuable in certain cases of the kind under observation. Professor Otis, having a case of stricture complicated with fistulous openings to treat, first incised the perineum, and opened the urethra externally to a slight extent, and then introduced a urethrotome, and freely divided all strictured portions of the canal.

Taking a lesson from this case of Professor Otis, I operated on my case in the following way:—

Having passed a No. 2 silver catheter through the strictures into the bladder, I made a free incision in the middle line of the perineum, through the thickened tissues, and opened into the urethra immediately behind the point of the posterior stricture. I made no attempt to divide the stricture by this external incision, but, having removed the catheter, I introduced along the urethra into the bladder the fine grooved staff of a urethrotome (one after Maisonneuve's principle), and then, by passing the knife of this instrument along the whole length of its groove, the entire strictured portions of the canal were thoroughly divided. The whole operation did not occupy more than a few minutes, and I was much impressed with the advantages as regards easy and quick performance over the method of external division as usually followed. A No. 12 catheter was readily passed into the bladder after the operation, and was retained there for twenty-four hours. The patient's progress after the operation was in every way satisfactory. The thickening of the tissues gradually but entirely disappeared, and the fistulous openings soundly closed. The urine now comes freely by the natural way, and a No. 12 bougie can be easily passed along the whole course of the urethra into the bladder. The operation wound in the perineum has nearly closed, and not more than a drop of urine passes occasionally through it.

A second case of urinary fistula was shortly after admitted into my wards, and was treated in the same way, with a like good result. The following is a brief note of this case:—

J. G., æt. 40, admitted on the 23rd of March. He had suffered from stricture of the urethra for five years, and six months before admission abscesses formed in the perineum and scrotum, and caused fistulous openings in these situations. On admission there was a fistulous opening in the perineum, and

another immediately anterior to the scrotum, with thickening of the surrounding textures; all the urine was passed through the fistulous openings. The introduction of a bougie discovered a tight stricture immediately anterior to the scrotum, and a second one in the region of the bulb.

On the 25th, an operation similar to that performed in the first case was successfully carried out. The result of this operation was also most satisfactory, and the patient was dismissed cured on the 24th of April. A No. 12 bougie could be readily passed along the whole of the urethra into the bladder, the thickening of the tissues had entirely disappeared, and the whole of the urine passed freely by the right way.

This plan of operating appears to me to be well worthy of the notice of surgeons. I do not advocate it in cases of stricture, other than those of which the cases related are illustrative examples, but I have no hesitation in strongly recommending it in suitable cases. Internal division is becoming more and more recognised in this country as the safest and most efficient treatment of strictures of the urethra which do not yield to simple dilatation, and my extended experience of this operation during the last few years has made me a firm advocate of it in proper cases.

The combination of internal division with external division in complicated strictures such as have just been illustrated by these cases has, in my opinion, the following advantages over external division alone:—

1. The complete and accurate division of all strictured portions of the urethra.
2. Its easy accomplishment.

In cases of complicated urinary fistula, in which the stricture of the urethra is impassable to instruments, or a portion of the canal is obliterated, I should in the first instance endeavour to re-establish a passage by external division; and then, if any portion of the urethra could still be felt to be strictured, I would introduce the urethrotome, and freely divide by internal division such contracted portion. — *Edinburgh Med. Journal*, June 1875, p. 1094.

57.—ON THE CONVERSION OF MR. WAKLEY'S STRICTURE DILATOR INTO A CATHETER STAFF WITH SLIDING CATHETER FOR URETHROTOMY.

By W. F. TEEVAN, Esq., B.A., Surgeon to the West London and St. Peter's Hospitals.

If the last editions of the various English surgical text-books be examined, it will be found that the staff illustrated and described for the performance of external urethrotomy

is much the same as the one which Tolet, the inventor of the operation, used two centuries ago. True it is that some few surgeons have divided strictures on a hollow staff, and that others have employed a catheter staff; but I am not aware of any staff in use by the profession which is free from both the objections which attach to the common staff for urethrotomy. When the ordinary staff has been passed down the urethra, the question to be asked is this: Where has it gone to?—is it in the bladder? Unless this interrogatory can be affirmatively answered, the surgeon who operates is exposing his patient to risk. It is not sufficient for the surgeon to say that he thinks the instrument is in the bladder; he ought to be sure that it is there, as surgeons have before now operated when they thought the staff was in the bladder, and it has turned out that the instrument had been passed into a false route. With the ordinary staff one cannot be certain where it has gone to, and to remedy the defect, a hollow staff has been used. The second objection is not so grave. When the ordinary staff is employed its shoulder marks out where the stricture begins, and accordingly the surgeon possesses the requisite information to enable him to fix, accurately, the spot for piercing the tissues; but, on the other hand, he does not know exactly where the stricture ends, and is obliged to grope about and feel his way bit by bit. Hence it is that when the staff is withdrawn it is sometimes difficult, and occasionally impossible, to introduce a catheter into the bladder, either because some distal tags of the stricture have not been divided, or that the incision into the urethra forms a kind of bay-window in which the catheter catches. Mr. Marshall has remedied this latter objection by adopting Mr. Thomas Wakley's principle of sliding an elastic catheter over the staff which thus served as a guide. Unless however, the situation of the staff is absolutely assured, this remedy is of but secondary value. Everything hinges upon the position of the instrument.

Some time ago when searching for a guide for subcutaneous urethrotomy that would be free from the objections alluded to, I perceived that if a longitudinal piece were cut out of the convexity of the metal catheter employed by Mr. Thomas Wakley, a groove would then be formed for the knife to run in; and that if a slit were made in the ferrule of the elastic catheter, there would result, from the alterations effected, a compound instrument possessing advantages not attached to any similar one, so far as I was aware of.

Mr. Thomas Wakley's instrument consists, as is well known,

of several distinct parts. A metal catheter; a long rod to be screwed into the metal catheter; an elastic tube or catheter open at both ends to be slipped over the united rod and catheter till it arrives at the stricture; and, lastly, a small movable handle which can be passed over and down the rod till it reaches the upper end of the elastic catheter, against which it is screwed tightly, so as to keep its vesical end well pressed against the obstruction. Now if we cut out a long narrow piece (about two inches in length) from the convexity of the metal catheter, we have at once made a groove for the knife to run in. This groove ought to terminate an inch and a half from the eye of the instrument. The next step is to have a slit cut in the metal ferrule of the elastic catheter for the knife to be inserted into it, and conducted thence into the groove in the metal catheter which ought to be in the same straight line as the other one. A notch ought to be made on the upper end of the elastic catheter, and on the same side as the slit in the ferrule is placed, in order that the assistant may know which surface to keep to the surgeon's front.

Whether the operation be subcutaneous or external urethrotomy, the metal catheter is first passed into the bladder, and if urine issues from the instrument the operation may be proceeded with. If, however, no water comes out, it may be assumed that the catheter is in a false passage and it must be withdrawn, and an attempt made to pass it into the bladder. Unless, however, the position of the instrument can be proved by the fact of the urine flowing from it, no operation ought to be undertaken. Provided the water escapes, the long rod may then be screwed into the catheter, and the elastic tube passed over and along it till it is stopped by the upper end of the stricture. The assistant then takes care to place the notch on the upper end of the elastic catheter so that it may face the surgeon, and having screwed on the handle and made the convexity of the metal catheter to project well in the perineum, the surgeon feels for the metal ferrule of the elastic catheter at A, pierces the structures in a downward direction, keeping the back of his knife to the staff. The further steps of the operation will differ according as it be subcutaneous or external urethrotomy. When the surgeon thinks he has completely divided the stricture he can prove the accuracy of his supposition by trying to slide the elastic catheter into the bladder whilst holding the upper end of the metal rod in position. If all the stricture be divided the elastic tube will glide smoothly into the bladder, where it can be left or not, as the operator may desire. The metal catheter is then withdrawn through the elastic one, which it leaves *in situ*.

Should the elastic catheter be obstructed at any point in its progress the knife must be introduced again, and any remaining tags of stricture cut through.

Mr. Thomas Wakley's instrument, modified in the way I have described, will be found invaluable for the performance of external or subcutaneous urethrotomy.—*Lancet*, May 29, 1875, p. 755.

58.—CASE OF PERINEAL SECTION, FOLLOWED BY THE
OPERATION OF DR. OTIS, FOR THE CURE OF
FISTULA IN THE PERINEUM.

By WALTER COULSON, Esq., Surgeon to the Lock and St. Peter's Hospitals, London.

The following case, considerably abridged, may serve as an introduction to some remarks on perineal fistula, and on the operation for stricture proposed by Dr. Otis, of New York, and recently performed in this country.

The case is that of Robert D., aged forty-four, seaman. About five years previous to his admission for the second time into hospital he had been treated for stricture, as an in-patient, by dilatation, at Guy's Hospital.

Two years ago (1873) he was admitted with extravasation of urine following retention. This condition was relieved by free incision of the perineum. The patient made a good recovery, but a perineal fistula remained, which it was hoped might be closed by continuing dilatation of the stricture. At the time of his leaving the hospital a No. 5 silver catheter (English scale) could be passed into the bladder; but the man neglected to attend as an out-patient, and when re-admitted, in May, 1875, he was unable to pass any urine naturally, the whole of it escaping in a small stream through the perineal fistula. The passage of the urine now causes great pain and scalding, which continue for some time after micturition; he suffers from a constant desire to micturate, the urethra is excessively sensitive, the urine loaded with mucus and pus, and no instrument can be passed into the bladder. Up to the 17th of May several attempts had been made to pass elastic instruments into the bladder by the penis and through the perineal opening, but they failed. He has been taking fifteen minims of sandalwood oil three times daily, which has materially diminished the muco-purulent deposit in the urine, but has had no effect in diminishing the scalding. On two occasions he had retention of urine, which was relieved, after some difficulty, by insinuating a small elastic instrument through the fistulous opening into the bladder, but all attempts to pass an instrument along

the penis from the meatus were unavailing. However, an extremely fine elastic bougie could be passed along the penis and out at the perineal opening.

On May 17th I performed the following operation:—A No. 8 steel bougie was passed down along the urethra, as near to the fistula as the thickened structures surrounding it would permit. A free incision was then made through the fistulous opening, and the adjacent strictured portion of the urethra was freely divided. A straight-grooved director was then passed through the wound into the bladder, the edges of the fistula were pared, and a No. 16 French elastic catheter was introduced into the bladder, the straight director acting as a guide. The catheter was tied into the bladder, and there retained until the following evening. No bad symptoms followed the operation, and the temperature of the patient remained unchanged. From this date until July 19th, both continuous and occasional dilatation was employed, and the edges of the wound were from time to time touched with caustic. The perineal wound became merely a fissured opening, but still it would not quite heal, and on every occasion that the patient passed water, some portion of the urine escaped through the fistula. The question then presented itself whether the fistula might not possibly be kept patent by some constriction in the penile portion of the urethra. With the assistance of Dr. Otis, an examination was made with the urethrometer, and the existence of three distinct points of constriction was demonstrated. It was therefore resolved that resort should be had to his operation. The patient was placed under the influence of ether administered by Mr. Knott, and the urethrotome of Dr. Otis was passed down as far as the fistula. The instrument was then made to indicate a dilatation corresponding to 32, French scale, and the three points of contraction were freely divided. The last-mentioned result was verified by the introduction of the bulbous sound, which was passed down as far as the fistulous opening, and withdrawn without a catch. A cylinder, open at both ends, and about five inches long, was tied into the urethra after the operation, and was allowed to remain in for six hours. This was done at the suggestion of Dr. Otis, but the cylinder was removed at the patient's request, as there was no sign of bleeding; the loss of blood after the operation was also slight. From the date of the operation, July 19th, to the 24th, no unfavourable symptom manifested itself. A No. 32 bougie was daily passed along the urethra to prevent adhesion, and the patient left the hospital cured. When he reported himself to me, Aug. 16th, the fistula was completely healed.

Before making any observations on this case, it may be well to notice the principal features of Dr. Otis's new operation.

The method of Dr. Otis is based on the simple proposition "that in all contractions of the urethra the contractile points must be reduced to the normal calibre of the urethra in its healthy state." This applies to all deviations, and, in Dr. Otis's view, especially to "comparatively slight contractions," which are not usually considered as requiring operative treatment. The term "slight contractions" refers to strictures which only admit 8 or 9 of the English scale. Dr. Otis maintains, as I have said, that any deviation from the normal standard, however slight, should become the subject of operative interference. The urethra must be brought back to its "normal calibre." But what is this normal calibre? According to Dr. Otis, "the capacity of the urethra always bears a constant relation to the size of the individual penis, which latter varies greatly in different individuals."

Thus, in the past year alone, Dr. Otis examined more than one hundred urethræ carefully. His conclusions are that the flaccid penis varies from three to four and a half inches in circumference, according to the individual, and that the circumference (or capacity) of the urethral canal varies from 30 to 40 of the French scale. Also, if we reduce the tables, every increase of one quarter of an inch in the circumference of the flaccid penis implies two degrees increase (as French scale) for the capacity of its urethral canal. Besides this, the urethrometer devised by Dr. Otis furnishes, according to him, in all cases, the exact normal calibre of the urethra; and to this calibre the diseased urethra must be brought in order to ensure a cure.

From what precedes, it follows that the surgeon must begin by ascertaining the normal calibre of the individual urethra. This ascertained, we have various methods of "sundering" the stricture at some point. The selection must rest on the judgment of the operator; but whatever method may be selected—whether rupture, dilatation, or division—*every* fibre of the constricting tissue must be completely severed, or subsequent recontraction is certain.

To ensure the attainment of these objects, Dr. Otis has devised a new form of urethrotome, which combines dilatation with division, though the object of dilatation is chiefly to enable us to apply the edge of the blade more surely to the structures which we intend to divide, and thus to protect, or nearly so, the healthy portions of the canal. All the bands which obstruct the canal must be divided one after another, if not detected at first. Dr. Otis never practises dilatation after the healing of the wound made during the operation. The incision is along the superior wall of the canal, against which the dilating portion of the instrument forcibly presses the blade. The use of

the sound after the operation is simply to separate the divided surfaces, not to dilate. The after-treatment consists merely in separating the wound throughout its extent by the easy passage of a full-sized steel sound daily, or every other day, until healing is complete. Finally, as recontraction of stricture after operation is simply due to incomplete division, and as the latter, as a rule, will be detected within one or two weeks, the cure may be considered complete after the expiration of that time if no change of calibre be detected. For a second operation, however, Dr. Otis frequently employs one of his earlier urethrotomes, which cut only at a single predetermined point, and the blades of which are not protected by a guard. He also maintains that in all long-standing cases of gleet contraction exists in some point of the urethral canal, and that such cases are cured by his operation. I am collecting twelve such cases myself, of not less than two years' duration, in which the operation has been performed. The results of these I hope to make known at some future time. Meanwhile a few observations may not be out of place here.

The operation just described, and the instruments employed, seem to present advantages over any other operative methods with which I am acquainted for the internal division of strictures in the penile portion of the urethra, and, so far as the mere division of the strictured part is concerned, it fairly fulfils all which the author claims for it. Another advantage which Dr. Otis attributes to his method of operating is that recontraction does not take place after cicatrisation of the divided tissues. If this be fully confirmed by subsequent experience, we must admit that the new operation effects what no other operative proceeding has effected—viz., a radical cure of stricture; that is to say, a condition of the urethra which shall require no future introduction of instruments.

Amongst the complications arising from stricture, extravasation of urine, and injury to the urethra, there are few which occasion more inconvenience to the patient and trouble to the surgeon than perineal fistula. In D.'s case the complication resulted from an operation performed for the relief of extravasation, and, dilatation having been tried and failing to close the fistula, perineal section was for a second time resorted to; but, in spite of this operation and subsequent dilatation, the fistula remained open.

The result of Dr. Otis's operation certainly proved that slight contractions which are not usually recognised as strictures may offer obstruction to the passage of the urine sufficient to prevent a urinary fistula from healing. The result of the internal division of the strictures and the daily introduction of full-sized instruments left the mucous wall of the canal, after

complete cicatrisation had taken place, as supple and non-resisting to the passage of the full-sized sound as a perfectly healthy urethra. Dr. Otis finds that this condition has continued for three years after the operation, and believes this result to be due—(1st) to complete division of every fibre of the stricture, and (2nd) to the prevention of contraction of the internal wound during the process of cicatrisation.

The ultimate success of the operation must depend on the permanency of this result, and at present it is impossible to express any positive opinion on this point until we have ascertained by pathological investigation what the precise nature of the cicatricial connective tissue may be. Up to the present time I have performed this operation for stricture in the penile portion only. But change of position may require a change of practice. In the sub-pubic portion of the urethra we often meet with old strictures which are dense in structure and resist dilatation. Forcible dilatation and incision employed in such cases might readily give rise to local or general accidents of a very severe nature; and hence subcutaneous division of the contracted tissues should probably be preferred as less liable to be followed by the evil consequences just mentioned.—*Lancet*, Aug. 28, 1875, p. 304.

59.—ON STRICTURE OF THE URETHRA.

By Dr. RAWDON MACNAMARA, Surgeon to the Meath Hospital, &c., Dublin.

In the vast majority of the cases of stricture which I have been called on to treat, I have been enabled to trace the origin of the disease to long-continued gonorrhoeal discharge, and, so far as my experience goes, I have been able to acquit the use of injections, when properly prescribed, of any share in bringing about the existing condition of the urethra. So impressed is my mind with the truth of this conviction, that I never hesitate to employ appropriate injections in the treatment of gonorrhoea, and I have never yet seen any, even the slightest symptoms of stricture, resulting in such cases, where the disease has proved amenable to treatment in any reasonable period of time, and were such now my object, I would be in a position to record a great number of such cases which have been successfully so treated by me, in a space of time in which no other plan of treatment could have removed the disease. Of course, in making this statement I by no means wish myself to be understood as ignoring the possibility of the superinduction of stricture by the use of highly cathartic injections—the same cause will produce the same effect here as elsewhere; but

I simply wish to observe that hitherto I have not been able to ascribe the supervention of stricture to the influence of injections judiciously prescribed.

In addition to the influence exercised by long-continued gonorrhœal discharges, I may observe that it has been my lot to see three cases in which the patients (adults) experienced most serious difficulty in micturition consequent upon stricture unconnected with any gonorrhœal history; in these cases the stricture was not situated in any portion of the urethra, but in a most unusual site, and one not generally described as the seat of stricture in systematic works on the subject: I allude to the prepuce, the opening of which was so contracted as scarcely to permit the passage of a bristle; in these cases the contraction was not of cicatricial origin, but was congenital, and required for its relief the operation of circumcision. In the museum of the Meath Hospital we have a pathological specimen strikingly illustrative of this condition. It has also been my lot to see several cases of stricture of traumatic origin—cases by the way always of a very troublesome and intractable character; and in a very few cases the patients have persistently denied any possible cause for their disease, insisting upon it that their stricture was congenital, and asserting that from the earliest period of their life they suffered from difficulty in passing water; but putting these to one side, I repeat that the vast majority of cases of stricture which have come under my observation owed their origin to long-continued gonorrhœal discharges.

I have met with cases of stricture, few to be sure in number, which were not benefited by the “immediate plan.” Notable amongst these is that form of stricture which may be described as the resilient, or elastic stricture. In such of these cases in which I have employed the “immediate plan” the result has been unsatisfactory. The patient, to be sure, has not been in any wise injured by the operation, but his symptoms, even if temporarily ameliorated, have surely reappeared; but then the same remark applies to every other plan suggested for the treatment of this, in my opinion, the most intractable form of stricture.

Confining my testimony as to its results to that class of cases in which I consider the employment of the “immediate plan” as being judicious, and (excluding from consideration the resilient and catheteric stricture) I can assert that a considerable number of my patients have derived permanent relief from this mode of procedure. That all have been equally fortunate is not the fact. Relapses have occurred in my practice, some of these attributable to the imprudence of the patient, some to his carelessness, some no doubt due to the tendency of

the urethra, once the seat of stricture, to recontract, no matter how treated.

Mr. Bernard Holt's instrument is that which I have principally used. It is simple in construction, efficient in use, and with ordinary care leaves but little to be desired. Mr. Richardson's instrument is also a most admirable one, and once safely lodged in the bladder, I cannot conceive how even the veriest blunderer can go astray with it. Both of these are metallic instruments, and occasionally difficulty will be experienced in introducing into the bladder an inflexible instrument, where, on the contrary, a flexible instrument will be passed with facility. In such cases Mr. Smyly's modification of Mr. Holt's instrument will be found of very great value. This latter instrument has frequently been of signal service to me. It would be altogether foreign to the scope of these remarks to enter upon a description of these several instruments; but I do feel that a few suggestions equally common to them all may not be out of place. In the observations I am about to make I take it for granted that the reader is already familiar with the construction of the instruments of which I am speaking, and that he will bear in mind that they consist of essentially two portions—the instrument properly so-called and its dilator. Well, then, having satisfied himself that the instrument is safely passed through the stricture and lodged in the bladder, the operator is to divaricate its blades by the rapid introduction of the dilator; but in carrying out this apparently simple manœuvre, it is most important to observe the direction in which the force is applied—it is not to be from before backwards, but rather from below upwards. A good rule to follow is to permit the instrument, after it has been introduced into the bladder, to gain its own position, and then steadily to retain it in that position whilst introducing the dilator. After the dilator has traversed the extent of the instrument the operator is to pause for a few minutes, and then withdraw instrument and dilator together, *not* having first withdrawn the dilator and then the instrument. For the surgeon to introduce into the bladder any one of these varieties of instruments it is necessary that the stricture should be patulous to the extent at least of permitting the passage of a No. 2 (Weiss's gauge) catheter; where such is not the case it must be dilated to that extent upon ordinary principles. After the surgeon has withdrawn the instrument he should introduce a No. 10 or 12 (Weiss's gauge) silver catheter, and empty his patient's bladder of any water which it may contain. By so doing two important objects are gained—first, a few hours' rest is secured for the urethra, inasmuch as that period of time will elapse before the patient will require to make water again; second, the

patient's mind will be satisfied by the introduction of an instrument of such size that his stricture has been effectually disposed of. The surgeon also may rest assured of it that there is less chance of a full-sized silver catheter becoming entangled in the laceration in the urethra than there would be in the case of a small-sized instrument. I would also recommend the surgeon to secure the presence of some urine in his patient's bladder at the time of the operation, as experience has taught me that thereby the carrying out of the several steps of the operation is much facilitated. I generally allow a day to intervene after the operation before I try again to introduce any instrument, and I am not disappointed if I fail in introducing as large an instrument as I had succeeded in passing after the operation, knowing well that in a day or two my efforts will be more successful, and that I will be able to pass even a larger instrument than I had done immediately after the operation.

Where the stricture is absolutely impassable, even by the smallest-sized instrument, brings me to the consideration of the last of the queries with which I have commenced these remarks.

In practice the surgeon meets with two varieties of stricture, in both of which at the time his best-directed efforts will fail in enabling him to pass through the stricture even the very smallest-sized instrument. But these differ from each other in the following very important particular: that in one the patient is able to pass water, in no matter how small a stream; in the other he cannot void a drop, no matter how strenuous be his efforts. I need scarcely point out how far more serious and distressing the latter condition is than the former. The first of these two conditions I have been for some years past in the habit of describing as the "impassable," the latter as the "impermeable," stricture. I am well aware how arbitrary may seem the distinction which I seek to make between these two words; but the distinction answers my purpose, and I take advantage of it. How readily the impassable stricture is made impermeable is but too well known to both surgeons and patients, both of whom, though from a different cause, are perhaps equally distressed at the occurrence. The young and inexperienced surgeon will meet with few cases that will cause him equal anxiety to one of impermeable stricture; the sufferings of the patient, and his own futile efforts to relieve them, all conduce to his embarrassment, and tend to render the management of the case more difficult. Probably the poor sufferer had previously applied, but in vain, in other quarters for relief, and he now presents himself carrying about his person sanguineous evidence of persevering but ineffectual efforts made to reach his bladder. Many such cases have come under

my notice; and whenever I find that previous abortive efforts had been made to pass an instrument, I never commence the treatment by trying to pass an instrument, but proceed as follows: I administer to the patient at once in a tablespoonful of water fifteen minims of a mixture composed of one part of the liquor morphinæ hydrochloratis (B.P.) and two parts of the tinctura ferri perchloridi (B.P.), and this I repeat every ten minutes until I succeed in my further efforts. As soon as I can I have him placed in a warm bath, the temperature of which, at first 98° of Fahrenheit's thermometer, is raised to 100°; and when he has been in this bath about fifteen minutes or so, by which time he will probably have taken his third or fourth dose of the mixture, I in the gentlest manner possible steal into his bladder a soft No. 2 (Weiss's gauge) gum elastic catheter, and once it has reached the bladder I take good care to leave it there until the following day. I know that, as a Professor of Materia Medica, I should be ashamed of the combination I have just suggested; but from repeated experience I also know its practical value. Proceeding after this fashion, I have never yet failed to relieve my patient, and it is a remarkable fact for a surgeon to a large metropolitan hospital to have to state, but nevertheless still a fact, that I have never yet seen the bladder tapped but on one occasion, and then I myself performed the operation. The case was a remarkable one: a very old blind man, who had lost penis and scrotum from the ravages of epithelioma, and in whom the most persevering efforts failed to discover the opening into the remains of the urethra. My distinguished friend and colleague, Mr. Porter, saw the case with me, and was equally unsuccessful with myself in his efforts to find the opening into the urethral canal. So far as to the treatment of the impermeable stricture. I shall now pass on to the consideration of the impassable form, where the patient is still able to pass water, but in a materially diminished stream, in some instances it escaping from him but *guttatim*. In the first instance I take bearings, passing down as far as I can, but in the gentlest manner, a large-sized instrument, and on its passage being arrested, I learn the site of the stricture—an important item of information, and one that generally will enable the experienced surgeon to predicate with tolerable accuracy whether he will have more than one stricture to cope with. Having learned so much, I now take a much smaller instrument, and upon failing to pass it, I have recourse to the smallest size in my armamentarium, and if, after repeated but most gentle efforts, I fail in introducing it, I desist for that day, making my patient take for fifteen or twenty minutes a warm bath, and ordering for him an anodyne

draught to be taken on going to bed. Here I would wish to pause for one moment to dwell upon the importance of extreme gentleness in the management of such cases. Nothing is to be gained by force. The instrument should, as it were, be coaxed, not driven, through the stricture. When dwelling on the importance of gentleness in our efforts to pass an instrument, Civiale says that it should be "swallowed" by the urethra, in using which expression he unwittingly foreshadowed that which I have since demonstrated—that the vermicular action of the urethra is towards, not from, the bladder. Should the slightest appearance of blood present itself I invariably desist for that day from my efforts to pass an instrument. Next day, if circumstances permit of it, I see my patient in bed, and I proceed as follows: I pass down to the stricture a fine catgut bougie, and when its course is arrested I commence to rotate it, always in that direction which will not unravel the gut, and after doing so some five or six times, I pull gently, very gently, on the catgut, and if it has wormed its way, be it ever so short a distance, into the stricture, it will give a sensation to the operator's hand of being gripped—held fast—by the stricture, a sensation which, when once experienced by the surgeon, can never afterwards be mistaken. Having felt this, I recommence the rotation of the catgut, and if the stricture be a short one, I worm its way on into the bladder, where I leave it for a few hours, and then withdraw it, again ordering my patient, as before, the warm bath and anodyne draught. The surgeon who employs this plan of treatment for the first time, on proceeding to withdraw the catgut, will be surprised at the amount of force he will have to use to overcome the tenacity of the grip with which the stricture holds the catgut, the latter having swollen considerably whilst lying in the moist warm urethra. After a few days of such treatment I experience no difficulty in introducing a small-sized catheter into the bladder, which I frequently leave in for a night, and thus the urethra will be sufficiently enlarged to admit of any form of instrument the surgeon may wish to employ for the purpose of completing the treatment on the "immediate plan." Of course, the time occupied in thus treating a stricture will depend materially on the length of the stricture which has to be traversed. I have had some cases where at least two inches of the urethra were involved in the disease; these were of traumatic origin; but in time I was fortunate enough to be able to "tunnel" my way through them, and eventually to effect a satisfactory cure. Occasionally the stricture is so irritable that on the slightest provocation it will bleed, and the case will not tolerate even the gentlest effort to introduce the catgut. Here I have derived valuable assistance from the employment of the wax

bougie. This is a kind of instrument, however, that requires far more gentle, cautious manipulation than any other, for upon the slightest pressure it will bend and break, turning upon itself; but, employed with care, it is capable of doing us good service. In one of my cases in which I was dilating the stricture by means of the catgut bougie, on withdrawing it there was pretty smart hemorrhage; but I was able to control it by passing down to the seat of the stricture a large-sized gum elastic catheter, and keeping it firmly pressed there for some time. The bleeding ceased, and the gentleman subsequently made a most satisfactory recovery. After using the catgut bougie two or three times it becomes so rough as to be unsuited for further use; however, by drawing it four or five times through fine glass paper it will become as smooth as ever—a hint for which the surgeon who uses many of these instruments in his practice will probably feel grateful.

I have already stated that I have hitherto hesitated to employ the “immediate plan” in those cases where I had reason to believe that a considerable length of the urethra was involved in the stricture, and promised to indicate the plan I pursue in the treatment of such cases. If able to pass a gum elastic catheter, of no matter what size, I tie it in, and let the patient sleep with it in his bladder. Next morning I experience no difficulty in introducing a larger sized instrument, which in a night or two afterwards, as circumstances indicate, is tied in, and so on until the urethra is fully dilated. If unable to succeed in the introduction of the catheter, I have recourse to the catgut or wax bougie, and proceed as I have already described. Of course, all this takes time, and is open to many sources of interruption, but by pursuing this course of “tunnelling and docking,” I have been most fortunate in conducting my cases to a satisfactory termination.—*Medical Press and Circular*, Sept. 29, 1875, p. 249.

60.—ON THE HYDROSTATICS OF THE CATHETER, AND A PROPOSED MODIFICATION OF ITS FORM.

By Dr. ROBERT SOMERVILLE, Galashiels.

A common experience occurred to me lately. I had occasion to draw off the urine of an old man, the subject of paralysis. The catheter had to be used twice daily. The passage of the instrument was easy enough, but owing to loss of power in the muscular coat of the bladder, the emptying of the viscus was a tedious and disagreeable thing. There was a gush of urine when the catheter entered, but the greater part of the urine was only to be voided by compression of the hypogastric region.

Why this should have been, it is not difficult to see. The patient lay on his back,—the usual position when the catheter is passed. Immediately on the introduction of the instrument, while the bladder was distended, it was quite possible to depress the outer end of the catheter to a level very little if at all higher than the level of its inner end inside the bladder; and it required very little pressure indeed to send the urine through what was, as far as mechanical force is concerned, a level tube. This small amount of pressure the elasticity of the distended organ was able to furnish. But after a certain amount of urine had passed out, one could not, without undue violence, keep the end of the instrument so much depressed, and the urine had several inches to ascend before it could make its exit from the catheter. The paralyzed bladder could not of itself drive the urine up to the height required, and unless forced out by the pressure of the hand on the belly, it ceased to flow. This state of things is not confined to paralytic patients, but there is more or less of it in almost every case of catheterism of the male bladder, when during the operation the man lies on his back; the fact being that in this position more effort is required on the part of the bladder than can reasonably be expected, even of the healthy organ.

When a column of water is of small diameter, we are apt to neglect the pressure it exercises. But it makes no difference whatever, whether the diameter of a column of fluid be great or small. Pressure depends solely on the height of the column, and the small quantity of urine in the catheter offers as much resistance to the contracting force of the bladder as if the instrument, instead of being only one eighth of an inch in diameter, were a whole inch, or twelve inches even. A catheter of ordinary size and shape, when in the bladder of a patient lying on his back, frequently has its external end from four to six inches above the level of the urine in the bladder, the urine in the instrument thereby exercising on the inner surface of the bladder the pressure of a perpendicular column six inches in height. What does this pressure amount to? In calculating it, we may disregard, as insignificant, the difference of the specific gravities of urine and pure water. A column of water, then, thirty feet high exerts a pressure equal to the pressure of the atmosphere, or fifteen pounds to the square inch. A column six inches high, being a sixtieth part of this, will exert one sixtieth part of the pressure, or a quarter of a pound to the square inch. A column four inches in height will give a pressure of $2\frac{2}{3}$ ounces. Hence it follows that the urine in the catheter must exert a pressure on every square inch of the bladder's internal surface of

from $2\frac{2}{3}$ ounces to 4 ounces ; and it is evident that if the bladder is to empty itself through the catheter, it must more than balance the pressure of the column. So that, to send the urine through the catheter when the external end is from four to six inches above the level of the urine in the bladder, every square inch of the bladder's wall must press on its contents with a force greater than that of $2\frac{2}{3}$ to 4 ounces. What wonder that, even with the help got from the abdominal muscles, a healthy bladder is scarcely equal to this, and an enfeebled organ quite incapable of it?

That, in the circumstances referred to, the entire force required to be exercised by the bladder is enormous, can be easily shown. Let us suppose that it contains 20 ounces of urine. This would occupy the bulk of somewhat over 34 cubic inches. The bladder is ovoid in shape, and has therefore a larger surface than if it were perfectly spherical. But a sphere, containing 34 cubic inches, has a diameter of rather more than four lineal inches, and a superficies therefore of upwards of 50 square inches. When the bladder then contains 20 ounces of urine, in order to overcome by its own contractility this pressure of a four-inch column of fluid in the catheter, it would require to exert a force of more than fifty times $2\frac{2}{3}$ ounces, or more than eight pounds. If the column were six inches in height, the force required would be more than twelve pounds. It may be objected to this estimate that, as a fact, we do not require, even in the case of the paralytic, to press on the hypogastrium with anything like this force. It is true. But the reason is that the structures behind and surrounding the bladder resist our pressure—exert, in fact, a counter-pressure on those portions of the bladder with which they are in contact, and enable us to effect our purpose with certainly not more than one half of the force we have calculated as necessary, if the bladder were to empty itself by its own contractility. In reference to this, however, it ought to be observed that a pressure of six or eight pounds is effected by the hand with far less effort than would be imagined by any one who has not deliberately experimented with the balance.

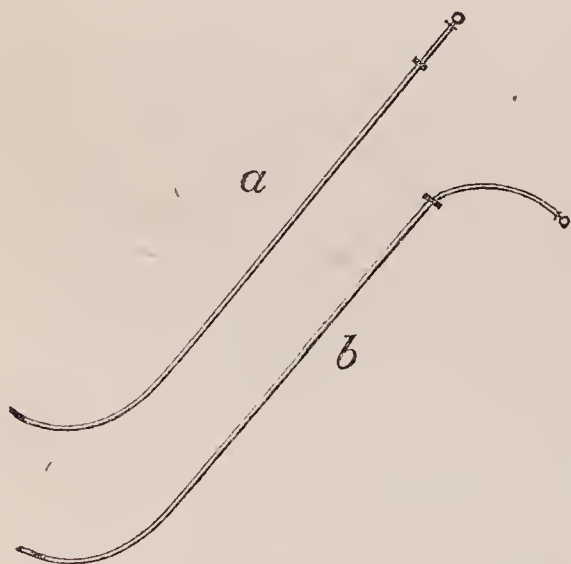
The mechanical disadvantage to the bladder, of having to raise the urine four or six inches above its own level, is easily illustrated when the female bladder is being emptied with a flexible catheter. The urine runs freely enough if the nozzle of the catheter be kept down, but the stream is at once arrested if the end of the instrument be raised a few inches.

Is there any method by which, in catheterizing the male bladder, the pressure of the column of urine in the instru-

ment could be done away with? There is. By using a very long flexible catheter, and bending down the outer half of it, so as to make the urine leave the instrument at as low a level as it enters it within the bladder, we balance the column which is obstructing the evacuation with one which facilitates it, and the only thing required of the bladder in this case is to overcome the friction of the urine against the interior of the tube. By bending down the end of the catheter still further, we convert it into a syphon, the long leg of which is external, and, the descending column of urine more than balancing the ascending one, the urine, having once begun to flow, is bound to go on running, until the bladder is entirely empty. The urine no longer requires to be pressed out, it is drawn out.

But flexible catheters are not passed with the same readiness as silver ones, and they are in many respects inconvenient. It would be desirable to have the ordinary metallic catheter used as the short leg of the syphon. This I have succeeded in arranging, by the very simple method of putting on a flexible tube to the extremity of a silver catheter, ending with a curve, instead of the straight abrupt extremity that

Fig. 1.



In Fig. 1, the ordinary form of catheter is represented by *a*, that ending in the curve by *b*.

the catheters at present in use have. I have had a catheter of this sort constructed for me by Mr. Gardner, of Edinburgh, and, after seeing it, I am much surprised that instruments of this form have not come into ordinary use long ere this. Apart altogether from its capability of forming part of a syphon, when used alone without the flexible tube, the urine flows from it into the receiving vessel so much more conveniently than from catheters of the ordinary shape, that I should now be sorry to return to the latter,

which almost invariably soil the bedclothes of the patient and the hands of the surgeon. All that is necessary to convert this form of catheter into a syphon, is to slip on to it the end of an indiarubber tube. Such a tube as is attached to a ball-pessary answers well. The tube must be considerably longer than the catheter, in order that it may form the long leg, and

the catheter the short leg, of the syphon. When, therefore, the catheter with the tube thus attached to it is introduced

Fig. 2.

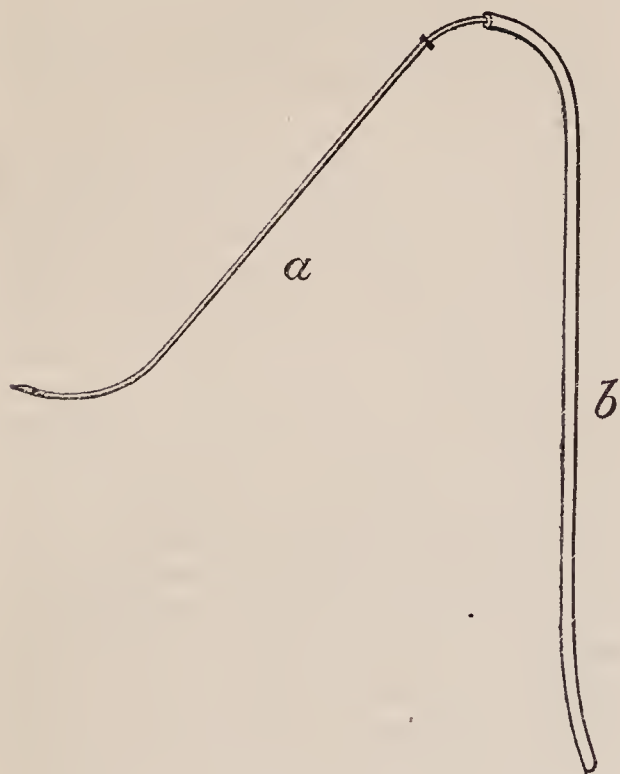


Fig. 2 shows the catheter with the india-rubber tube attached: the catheter *a* being the short leg, and the tube *b* being the long leg of the syphon.

into the bladder distended with urine, and the external end of the catheter is bent down towards the patient's bed, the first gush of urine fills both catheter and india-rubber tube, and flows out at the extremity of the latter. We may now allow the catheter to assume the position that the elasticity of the patient's tissues, uninterfered with, assigns to it. The external end of the catheter will spring up, yet the urine will continue to flow; for the syphon having once commenced to act, the emptying of the bladder will go on until the whole of what it contains is drawn off. Since the longer the descending column of fluid is, the more satisfactorily does the syphon work, I have found it of advantage to carry the tube below the thigh of the patient, and allow the urine to run into a vessel standing at the side of, and at a lower level than, the bed.

For syphoning the bladder, however, it is not necessary to have a catheter specially constructed. In my first experiments, the bend of the syphon was formed by a curved metallic tube slipped on to an ordinary catheter. It worked well enough, provided the junction, between the catheter and the tube were air-tight, this being absolutely necessary to the syphon arrangement. A very little cotton wadding, wrapped round the end of the catheter before the tube was slipped on to it, effected this.

This whole matter of the pressure of the urine in the catheter when once looked at, is so simple and obvious that one cannot but have misgivings as to the necessity of asking the attention of the profession to it. On the other hand, its very simplicity may have caused it to be overlooked, and the advantages of the proposed method of using the catheter appear to me to be considerable. They are:—

First, Its convenience and cleanliness. We only need to see that the urine begins to flow. After this the syphon is self-acting; and provided that the inner end of the instrument remains in the bladder, as long as there is any urine to come, it will be drawn out. And then not a drop of urine need be spilt. These things are important in cases where the catheter requires to be habitually employed.

Secondly, It completely empties the bladder. Even when the bladder has not lost its tone, with the patient on his back, it is difficult to draw off the urine completely with the ordinary form of catheter; and when the muscular coat of the organ is paralyzed, it is almost impossible. Yet it is of great consequence to take away the whole of the urine, when it is alkaline and prone to decomposition.

Thirdly, It reduces the irritation of the mucous membrane by the catheter to the least possible degree. Every one knows the evil effects that in many cases follow the repeated introduction of the catheter. The rubbing of the end of the instrument against the internal surface of the bladder must be serious indeed, when the latter is driven by external manipulation against the unyielding metal, with the force that we have seen to be necessary to raise the urine to the outer end of the ordinary catheter. By doing away with the necessity of external pressure we save the patient from this source of injury.

Fourthly, It avoids entirely the temptation one often has, when the urine has ceased to flow, to raise the patient into an erect or semi-erect position,—a proceeding never devoid of danger with a metallic catheter in the bladder.—*Edinburgh Medical Journal*, Aug. 1875, p. 127.

AFFECTIONS OF THE SKIN.

61.—ON GOUTY AFFECTIONS OF THE SKIN, AND OF THE DIGESTIVE AND VASCULAR SYSTEMS; AND ON THE TREATMENT OF GOUT IN SURGERY.

By Sir JAMES PAGET, Bart., D.C.L., LL.D., F.R.S., Consulting Surgeon to St. Bartholomew's Hospital.

Sir James Paget, in the early part of the lecture, pointed out the relations existing between gout and various forms of diseases of the skin, such as psoriasis, eczema, urticaria, prurigo, pruritus, &c. These relations were not to be found in any anatomical features, or in any peculiarity of appearance: an eczema or a psoriasis in a gouty person could not generally be distinguished by its own characters from one that occurred in

a patient who had no gout. It was in connection with the treatment of these cases that the diathesis was important. It was as necessary, or rather much more necessary, to consider the person's constitution than the specific characters of his local disease. In following this rule, we must look to all the circumstances and antecedents of the case. For example, if eczema were found in a patient who had already had gout in its regular form, there must be a strong suspicion that the eruption depended on gout, and it must be treated in this view: such treatment was as much called for here as it would be in a case of inflammation of a joint in one who was known to be gouty; and the same must be held for psoriasis, or any of the forms of prurigo. If they were met with in those who presented some of the minor signs of gout that had been described in former lectures, or even if they were seen in the elder members of families in which gout was very prevalent, it must be carefully considered whether they were not dependent on the same constitutional defect, whether they were not incomplete gout appearing in the skin, just as, in another man, it might appear in the bronchial tubes, or in the proper texture of the lungs, or in the joints. One character which these affections of the skin evinced in common with other gouty diseases, was the sudden manner in which they were often developed: thus they might occur suddenly in the night, without any previously suspected cause, unless it were some indigestion or some unusual diet of the day. This peculiarity was well marked in the more acute cases of gouty eczema, and gouty psoriasis of the skin. And some help in diagnosis could be gained from the observation that they were uniformly made worse by those articles of food that were notoriously bad for complete gout—fermenting drinks, beer, champagne, hard food, salt, &c. However, this was a point on which too great reliance was not to be placed, for nearly all skin-diseases, both acute and chronic, were made worse by the kinds of food just mentioned. There was a short rule that used to be given in the out-patients' room, and it certainly was a good one. The patients were told to have nothing salt, strong, sour, or sweet. It might seem that such a rule shut patients out from all the comforts of life in respect to diet: it was meant, however, merely as a rule against the excessive or too ample quantities of strong drinks, acids, salt, and sugar, which many persons habitually used in their diet. But the main point to be insisted upon was that, in the study of all affections of the skin occurring in elderly persons, the question whether the disease was associated with a gouty constitution should be looked to; for if this were forgotten, treatment would be very likely to fail. Here a caution was given against a danger that might arise out of the present method pursued

in the nomenclature of skin-diseases. Their classification had grown very minute of late, and it was founded mainly on an anatomical basis. There was nothing in it that could afford any indication of the constitutional condition with which the various forms of disease were associated; and there was certainly some likelihood that this important side of the question might be overlooked. Among other cases of skin-disease in relation to gout, were ulcers of the integuments, which followed collections of urate of soda in the form of chalk-stone. Where these collections occurred, repeated attacks of inflammation in the skin over them ensued, and then an ulcer formed, weeping out continually a thin ichorous pus, with chalky matter. These ulcers, which were very troublesome to manage, might be treated with water-dressing, or with solution of soda, until the deposit was removed, and then, to promote their healing, with solution of nitrate of silver painted over their surface.

Another form of skin-disease often seen, especially in old men, was an eczematous ulcer about the ankle. There were a number of persons who suffered from eczematous ulcers, as they might be called—that is, they had eczema, some portion of which became the seat of a thin, shallow layer of ulceration. This condition was frequently intolerably painful, especially when the patient lay down, or while he was in bed. Patients constantly complained that when they were in the warmth and quietude of the bed, the pain became an agony. Nearly all such ulcers were gouty. In many persons the ulcer was associated with a varicose state of the veins; not, it was to be observed, with the large tortuous blue veins that are commonly termed varicose, but with large clusters of the smaller veins, collected about the ankle or some part of the leg. These clusters were not all blue, but some were as bright as if they contained arterial blood. It was often said that the ulcers in these cases depended upon varicose veins, and even that the varicose veins were the source of the eczema. That view, however, was a fallacy. Many of those who had varicose veins never had any symptom of eczema. Both the eczema and its superficial ulceration depended on incomplete gout, and the presence of the varicose veins was merely a coincidence.

Some gouty affections of the digestive organs were next referred to. There were many persons who could tell almost certainly by the state of their tongue that they were about to be attacked with gout. It was not meant that there was any one condition of the tongue that was met with in all patients alike; but that many men learnt by experience that, when they found their tongue coated in a particular way, it indicated the coming of gout. Each man knew his own tongue in this sense. All he had been able to observe in these cases was, that

a thin white fur was coated thinly over the whole tongue; yet some patients could tell by it, and tell truly, that their gout was at hand. There was one disease of the tongue, however, that was found associated with gout, viz., psoriasis: a condition in which the mucous membrane became smeared all over with a thickish opaque white covering, which some had compared with a layer of mucus left behind by a snail tracking its way over wood. This condition of psoriasis might be very frequently seen in the syphilitic patients in the hospital, and it was very difficult, by the characters of the disease itself, to discriminate between the syphilitic psoriasis of the tongue and the gouty; but it might be taken that, in the great majority of cases, the disease depended on one or other of these constitutional conditions; there seemed to be exceedingly few cases but the syphilitic and the gouty in which psoriasis of the tongue occurred.

Then, again, respecting certain diseases of the pharynx and soft palate in elderly persons. An elongated uvula was in old people, he would not say always characteristic of gout, but it was very suggestive of it. There were few except gouty persons who habitually had at or after middle age an elongated uvula. In nearly all signs would be found, either of the well marked complete gout or the minor forms which had been spoken of. And there was a condition of what might be called pharyngitis, which was often associated with this, when the whole of the mucous membrane of the pharynx passed into a condition very like that of the elongated uvula, looking clogged, heavy, oedematous, and, as it were, slow to move, and covered with an unusually thick glossy epithelium. The pharynx, it was remarked in passing, was a part to be carefully studied for the indications it afforded of constitutional disease. Thus there was a condition of the pharynx which was almost always an evidence of tuberculosis, in which it was covered with granular prominent glands. Again, scrofulous disease was often found here. Dr. Brinton had described what he regarded as a gouty form of dysphagia, and he was so good an observer, that it was not likely he was mistaken; but he (Sir James Paget) could not say that he had been able to recognise the condition in any cases he had seen.

As to gouty dyspepsia, little need be said in the course of a surgical lecture; but it might be remarked that dyspepsia was more common in the gouty than in almost any other class of patients, such as the tuberculous, the scrofulous, the anæmic, the nervous. And there were some features always prominently marked in the dyspepsia of the gouty. These persons suffered especially with acidity and flatulence, and they were patients with whom many articles of diet habitually disagreed, making

them, as they vaguely expressed it, "bilious," or giving them headaches. These offending articles of diet also frequently brought out some of the minor signs of gout with great rapidity. Many persons, if they took beer, or champagne, or any drink which was incompletely fermented, were almost certain to find, on waking next morning, that their knuckles were stiff and painful, or that they had burning palms or soles, or some neuralgia about the scalp. This development of certain symptoms after the use of certain articles of diet was, indeed, so uniform, that it afforded a valuable test of the existence of the gouty constitution, just as the speedy effect of mercury or iodide of potassium indicated the presence of syphilis, or that of quinine the presence of ague. These were not, he thought, indifferent or minor facts; they were really among the things that must be often used in practice.

The lecturer then passed on to refer to gout as affecting the vascular system. It had been held by some observers that atheromatous disease of the arteries was mainly due to the gouty constitution. There were, however, many grounds for doubting this; and probably all that could be said was that, as severe or long-continued gout induced extensive degenerative changes in almost all the textures of the body, the arteries were affected in common with the rest. Certainly aneurism was less frequent in the gouty than in the syphilitic, and senile gangrene was not more prevalent among elderly gouty persons than among other classes of patients at the same age. Gouty disease of the veins—gouty phlebitis—however, was undoubtedly a very common affection. It was by far the most frequent form in which anything that could be called idiopathic phlebitis occurred. It was perhaps one of the most frequent of the irregular forms of gout; and any case of phlebitis occurring without an apparent cause in an elderly person might be suspected to be of this nature, particularly if the attack were very sudden.

This closed the list of the minor signs and forms of gout that Sir James Paget mentioned; but he remarked that his aim had not been to refer to all that could be collected, but rather to select such specimens as might direct the attention of his hearers to the subject, and induce them to study it carefully for themselves. Then, as to the treatment of gout as it was seen in surgery: at the first glance, it might appear that the treatment of gout could be summed up in a few sentences; certain rules were always good; certain medicines were always useful. But it must be remembered that gout was an affection that mixed itself with whatever other constitutional defect was present in the patient it attacked; and thus not only were there modified forms of gout, but there must be, to meet these,

modified forms of treatment. Of course, the treatment of a gouty man who was also scrofulous must be different from that required for one who was syphilitic, or nervous, or healthy besides his gout. Then, again, the gout needed very different treatment according to its intensity. There was no doubt that colchicum had a remarkable influence upon all cases of complete gout; and it might probably be taken as a rule that the more complete the form of gout was, the more it affected the joints, and held to those without shifting to other textures, the more marked would be the benefit that would result from colchicum. Given in appropriate doses at right times, it undoubtedly materially shortened an attack of complete gout in any joint, especially in or about the foot. Colchicum had a comparatively small range of utility in incomplete gout, or in the irregular form that had been mentioned as usual in surgical practice; for instance, the utility of colchicum in acute gouty eczema was very limited, and the same may be said of it in acute gouty phlebitis. It should be noted that in those who were scrofulous or tuberculous, and at the same time gouty, colchicum must be given, in order that its depressing influence might be avoided, in small doses, and with quinine, or iron, or some other tonic. What had been said of colchicum, might be said also of another medicine that was esteemed as specific. Veratrum, commonly given as veratria, had a definite influence upon complete gout; it was to be doubted whether it had any effect at all on incomplete gout.

As to diuretics, diaphoretics, and purgatives, these were often useful; but this, probably not because they had any direct influence on the gout itself, but because they corrected some coincident defect of health; they promoted excretion, which was frequently very imperfect in gouty persons.

There were three things chiefly which had to be considered for all gouty persons. First, the drinking of a certain extra quantity of water, there was no doubt, was essential for the maintenance of health in many of these patients. An excellent plan was to drink water in the early morning. Many gouty persons were able to diminish, or even get rid of their minor symptoms of gout, by drinking half a pint of water while they were dressing in the morning, and before they had taken any solid food. Those who found an excess of lithic acid or of lithates in their urine should take some alkaline water instead of plain water, and they should drink enough to render the urine clear and free from deposit. Many of the German alkaline waters, such as the Carlsbad and the Vichy, were very useful; or those that were purgative as well as alkaline might be employed when the bowels were confined. Secondly, as to baths and thorough washing: in gouty persons, as a rule, the

skin acted inefficiently, and therefore all gouty persons—in common, indeed, with all others—should use a bath every day. It was, however, doubtful whether cold water should be used by those who were elderly. If there were a tendency to neuralgia, or to any of the more painful forms of rheumatic troubles of the joints, or lumbago, or even general feebleness of the circulation, tepid water should be used. And, in order to secure a thorough cleansing of the skin, mere cold or mere warm water was not enough; the greasy material that collected on the surface must be washed away with soap and good rubbing and frictions. Persons who were fat and whose skins were hairy might have a Turkish bath, but thorough daily washing with warm water and soap was all that could be required. And, in connection with the bath, was a matter that was too seldom attended to in England, though it was productive of much benefit in the various health-resorts in Germany,—the custom of going to bed for an hour or two hours directly after the bath had been taken. In Germany, the patient, after taking some slight amount of food to avoid faintness, had his bath, and then went to bed for some short time. Probably, under these circumstances, quite as much good was done in bed as in the bath; while the body was covered and completely at rest, and the nervous system tranquillised, the skin acted freely. If our English baths were used with the same care in this respect as is taken in those abroad, we should work much better cures with them. Thirdly, as to diet: gouty folks should be very moderate in all their food—not, however, too abstemious, for these patients were seldom really vigorous, or able to dispense with a nutritious diet. But moderation should be observed, particularly in respect to the use of stimulants; and each patient must select for himself, or be advised to take what suited him best. There was a prevalent opinion that spirits were better than wine; but he doubted whether this was really true. The chief point was, that whatever stimulant was taken should be used in the most strict moderation.—*British Medical Journal*, June 5, 1875, p. 737.

62.—A NEW METHOD OF PERFORMING PLASTIC OPERATIONS.

By Dr. J. R. WOLFE, Surgeon to the Glasgow Ophthalmic Institution.

It is now nearly three hundred years since Tagliacozzi published his great work on Plastic Operations; and, notwithstanding the admiration which the work of the Bologna professor had elicited, it is remarkable how comparatively little has since been

done for the cultivation of plastic surgery. The reasons are obvious. The fact is that, in operations on the nose, eyelids, and face—the most interesting regions for improving deformities—Tagliacozzi's method of taking flaps from the arm has been generally abandoned, on account of the extreme discomfort which it involves; and the practice of taking flaps from the forehead or face having been the only one in vogue, the procedure came to be considered more serious. In addition, when we take into account the elements of failure, from shrinking of the flap, from erysipelas or gangrene, it is not to be wondered at that surgeons are generally chary of resorting to the expedient, except in great emergencies. It amounts to this: we are to cut skin off the face to repair the face; and, in doing so, we run great risk of failure. To render plastic operations on the face more acceptable, and to bring them within a wider scope of utility, the following conditions must be fulfilled. 1. We must take a flap from the arm, or from any other part but the face. 2. We must seek to eliminate the elements of failure. I propose, in this short communication, to indicate the means of fulfilling both these conditions.

First, Tagliacozzi laid down the rule, which has ever since been considered as the primary law, and *sine quâ non* to the success of the operation, that the flap must retain its connection to the adjacent living structure by a pedicle which is to be severed only after complete union and cicatrisation of the raw surfaces. This pedicle has, in my opinion, been a source of great embarrassment to surgeons, and tended rather to retard the progress of plastic surgery. From my observations on transplantation of structures from the lower animals and on skin-grafting, as well as on plastic operations, I have long held it demonstrated, that in most cases the pedicle is not essential, if indeed it do contribute anything, to the vitality of the flap. This being once established, we are henceforward free to choose our bit of skin from any part of the body we may find suitable.

My next endeavour has been to eliminate the elements of failure. The principal cause of failure I find to be in the subcutaneous structures. If we wish a skin-flap to adhere to a new surface by first intention or agglutination, we must be sure that it is cleared of all areolar tissue, and properly fixed in its new place. The following case will illustrate the points referred to.

Formation of the Lower Eyelid with Skin from the Forearm.—P. C., aged 25, a quarrier, was admitted into the Glasgow Ophthalmic Institution, with his face, eyes, and eyelids injured by an explosion of powder. I showed the man recently to the Edinburgh Meeting of the Association, as an instance of conjunctival transplantation from the rabbit. The right upper

eyelid, which was strongly everted, I partially succeeded in correcting by skin-grafting. The lower right eyelid being completely everted, its integument totally destroyed, and the skin of the face consisting of discoloured cicatrices not by any means suitable for plastic operations, I formed a new lower eyelid in the following manner. The edges of the upper and lower eyelids having been vivified, I introduced three ligatures into the border of the lower eyelid, which I entrusted to my assistant. By means of these ligatures, he used traction, whilst I dissected the whole of the cicatricial tissue, and thus liberated the subjacent structure. The ligatures were then introduced into the upper eyelid, and the edges of the upper and lower eyelids were thus united. I then elevated the edges of the wound, preparing them to receive the new flap like a watch-glass. The skin required for the formation of this eyelid was two inches in length and one inch in breadth, which I took from the forearm. To test the principles above indicated, I divided my flap into three portions. The first I removed, along with the cellular tissue, as close to the dermis as compatible with the integrity of the flap. The other two portions, after removing them from the forearm, I turned up; and with a cataract-knife, I sliced off the areolar tissue, leaving a white surface, which I applied to the eyelid. The difference between these flaps was very remarkable. The two flaps, which were previously prepared, healed by agglutination, without exhibiting even the slightest tendency to desquamation of the cuticle. Twenty-four hours after the operation, the surfaces looked pale; but the next day the temperature was normal, and appearance healthy; whilst that part which was applied without previous preparation looked rather livid the first day, improved the next two days; the fourth day, it began slightly to suppurate; and, after a hard struggle for life, a portion of it only remained, while the rest shrank. This, however, will not compromise the result of the operation, which may be considered satisfactory.

The dressing consisted of gutta-percha tissue applied next to the skin, a graduated lint-compress, and a bandage to maintain immobility of both eyes. The union was so rapid and so perfect, that I separated the upper from the lower eyelid on the fourth day.—*British Medical Journal*, Sept. 18, 1875, p. 360.

63.—TREATMENT OF PORRIGO, TINEA FAVOSA, ETC.

By Dr. HENRY MACCORMAC.

[The results of treatment for parasitic cutaneous diseases are often disappointing, but Dr. Maccormac has found much more satisfactory results from petroleum than from any remedy previously tried.]

The first thing I do, the scalp being concerned, is to clip or, where it can be done, or as far as it can be done, shave the hair closely off, and keep it so. In cases that have been neglected, it will be desirable to premise a few simple poultices, bread or linseed meal. I direct the petroleum to be applied twice daily, by inunction, in the form of one part petroleum to two of lard and a few drops of oil of lavender or, say from half a pint to a pint of petroleum in a pound of lard, with twenty drops of oil of lavender. The vessel or jar which contains these, may be stood in a basin of boiling water, occasionally renewed, stirring with a wooden spatula until the whole is intimately blended.

This unguent is to be applied, gently but thoroughly, once or if it be practicable, twice daily. A soft brush is a very good implement to use, and the ointment when about to be applied, may be moderately warmed beforehand by standing the cup or gallipot, which contains it, in hot water. Judgment must be used in apportioning the strength of the ointment and the amount of the application to the state of the parts and the irritability of the subject. After the application a piece of dry soft clean linen rag may be laid on—an old cambric handkerchief answers very well—and over all, a soft clean linen cap.

Before the next application of the petroleum ointment, the head must be thoroughly but gently washed with black or fish soap and fresh warm soft water. The ointment is then to be reapplied as before. Every rag or cap, once used and past further use, should be thrown into the fire, but if intended for further use, plunged in a hot soda ley, and after being well washed, finally rinsed in water containing a little carbolic acid.

The last instance of porrigo which I had to deal with, was in a cutler's daughter. Her case was rather a distressing one, with many sores, the hair had mostly disappeared, and there were vermin as well. The very first application proved advantageous, and the patient did well in every respect, except as to regaining her hair, afterward. The family have removed, and I cannot speak of the young woman's present state, but I have no reason to doubt but that it is satisfactory.

In a recent case of trichophyton tonsurans in a youth of eighteen, a large patch of hair, producing great disfigurement, was absent. I must here observe that I had begun with pencilling a weak alcoholic solution of corrosive sublimate over the parts. I then had recourse to the petroleum ointment and black soap. The case, after some continuance of treatment, has done extremely well. A vigorous growth of hair now covers the previously denuded surface. A preceding case of trychophyton occurred in a pretty young Jewess. A naked patch rather larger than a crown piece, subsisted at the very

vertex. The young lady has since married, and the vertex, when I saw her last, bears no trace of having ever been wanting in respect of its hairy covering.

I wish to add that the petroleum ointment with black soap, is an excellent remedy in itch, removing it with ease and safety. It is a capital remedy for lice, destroying them on the pubis, in the axilla, or on the head. In two or three instances where these hideous vermin had extended over the whole surface, the petroleum ointment with black soap and the warm bath, employed twice daily, removed them with magical celerity. In insane persons, whereon vermin often house, petroleum ointment and soap, proves most useful. So far as I have had an opportunity of trying it, I find the petroleum alike serviceable in the mange of dogs, swine, and horses, destroying the minute parasites along with the cutaneous affections which they engender.—*Practitioner*, Oct. 1875, p. 261.

64.—ON THE HYPODERMIC TREATMENT OF INDOLENT ENLARGEMENTS OF THE CERVICAL GLANDS.

By Dr. MORELL MACKENZIE, Physician to the Hospital for Diseases of the Throat, London.

Indolent glandular enlargements should be either cured radically or left altogether untreated. Half-measures only give rise to disappointment and cause disfigurement. An enlarged gland may be a slight blemish, but when it has been blistered, poulticed, painted with iodine, incised, or subjected to any of the various modes of treatment recommended in such cases, it often becomes a deformity.

As a rule, parents and young ladies are very desirous to get rid of these glandular swellings, not only on account of the disfigurement which they occasion, but because they are regarded as blots on the family escutcheon. It becomes important, under these circumstances, not only to disperse the tumours, but to leave behind as slight traces of their previous existence as possible. For the last eighteen months I have been engaged in trying various remedies, hypodermically, with a view of curing indolent glandular swellings. I have tried solutions of pepsine with and without dilute hydrochloric acid, dilute hydrochloric acid alone, dilute acetic acid, tincture of iodine, alcohol, solution of nitrate of silver, solution of chloride of zinc, and several other remedies.

In carrying out hypodermic treatment the cure may be effected either by resolution or by destruction. In the former case absorption takes place; in the latter the injection is followed sooner or latter by suppuration. It is desirable,

if possible, to cure by resolution. I have found acetic acid, as recommended by Dr. Broadbent for the treatment of certain kinds of cancer, the most useful remedy for this purpose. With this agent I have treated twenty-seven cases; of these fifteen were completely cured by resolution, four were greatly benefited, in five suppuration took place, and three patients discontinued treatment without any decided effect having been produced. I have used the ordinary dilute acetic acid of the British Pharmacopœia, and have generally injected from five to twenty drops, according to the size of the gland to be treated, seven or eight drops being an average dose. The injection should not be made more than once a week. The fluid should be injected well into the middle of the gland. Suppuration has generally resulted from the solution having been injected either too frequently or too superficially. If suppuration take place, the fluid should be drawn off with a hypodermic syringe or aspirator. The average duration of treatment by resolution is three months.

For treatment by destruction and suppuration, a solution of nitrate of silver answers best. The solution should be of the strength of one drachm to the ounce, and not more than three to five drops should be used. Considerable interstitial destruction is generally produced after three or four injections, sometimes after a single injection. When pus forms, it should be drawn off as already directed. Treatment by destruction, if successful, is rather more rapid than that by resolution, but induration of the outer portion of the gland sometimes follows the treatment, and interferes with its success. I have treated five cases in this way; in three of them the cure was complete, in two incomplete. The treatment by pepsine and dilute hydrochloric acid was rapid, but was twice followed by superficial sloughs of the skin, and for that reason I abandoned it.—*Medical Times and Gazette*, May 29, 1875, p. 577.

65.—A NEW MODE OF TREATING CERTAIN TUMOURS OF THE LYMPHATIC GLANDS.

By S. MESSENGER BRADLEY, Esq., Manchester.

At the recent Edinburgh meeting of the British Medical Association a paper of mine was read in which I advocated the subcutaneous injection of iodine in certain cases of lymphatic tumours, and as I have since then employed this method in several fresh cases I have thought that a brief account of the mode of procedure might prove interesting. It must be premised that I do not speak of lymphatic tumours generally, but of certain kinds only; thus I do not refer to syphilitic or carcinomatous

affections, or to the infectious or soft form of lymphomata, but confine my attention to three groups. First, true hypertrophies of the lymphatic glands, with or without a strumous diathesis; second, strumous hypertrophies—*i.e.*, cases of cellular hyperplasia *plus* caseous deposit; and, third, hard non-infectious lymphomata, which present many points of resemblance to the first groups, and, indeed, are often only distinguishable in being multiple.

Now, there is perhaps nothing more common than to paint iodine over all the above-mentioned tumours unless it be the disappointment which results. This, at least, is my experience, the result apparently being the same whether the iodine is painted indiscriminately over the whole gland or whether it is applied, according to Furneaux Jordan's advice, over the contiguous lymphatics rather than over the gland itself; and yet all that seems to stand between this treatment and success is the thin skin which intervenes between the gland and the pigment.

The first case in which I injected iodine into a tumour did not appear very promising, though it proved perfectly successful. It was an encapsulated tumour, about the size of a large walnut, situated beneath the lower jaw, which I should have removed with a scalpel, had I not once had some unpleasant hemorrhage in a precisely similar case; and as the patient in the present instance lived at some distance, I resolved to try to procure absorption before resorting to extirpation. *The tumour almost disappeared with the first injection*, and after one more it could not be at all detected. I was pleased with the result, because it appeared to me to be so desirable to adopt such a plan at one's consulting-rooms, and in the out-patient room of the hospital, instead of using the knife, which is always more or less terrible to the patient, and which is sometimes, in the most careful hands, followed by unfortunate results. Since the case I mention I have been in almost the daily habit of employing iodine in this manner, and I think I may venture to affirm that, by properly selecting cases, a successful result may be assured, while there is no doubt that an indiscriminate use of the remedy will be productive of disappointment. The best cases are those where a single cervical gland is hypertrophied in an otherwise healthy (adult) subject. Five or six injections of the simple tincture of iodine (five to ten minims at a time, according to the size of the tumour), at intervals of about four days, generally effect a cure. The earlier stages of strumous hypertrophies are also very successfully treated by this method, as are the small hard multiple lymphomata; but in the later stages of strumous disease of the cervical glands, where the tumour is broken down into a mass of caseous matter, and the

neighbouring skin is blue and undermined, no good results follow from the injection of iodine; and, indeed, these cases are best treated by a careful excision of the disorganised and degenerated glands. I have also recently employed iodine injections in a large and hard fibroid bronchocele, which had been treated unsuccessfully by the internal administration of the drug. The tumour was not only inconvenient from its size, but had almost destroyed the voice, and so pressed on the trachea as to deflect it to the right side of the neck. The case is still under treatment, but the first two injections of ten minims of iodine were followed by the diminution of an inch in the girth of the neck. By parity of reasoning we may expect this method to prove serviceable in uterine myomata and allied growths, but it is to its value as a remedial agent in cases of lymphatic enlargement of the cervical glands that I especially wish to call attention, and I may briefly summarise my results on this head by a tabular statement:—

1. *Cases of cervical tumours to be treated by injection of iodine.*
 - a. True hypertrophies of the lymphatic glands without strumous admixture.
 - b. Strumous hypertrophies before breaking down.
 - c. Hard lymphomata.
 - d. Encapsulated cervical tumours, as a tentative operation.
2. *Cases of cervical tumours to be treated by incision.*
 - a. Strumous glands which have broken down into pus, with or without previous treatment by injection.
3. *Cases of cervical tumours to be treated by excision.*
 - a. Strumous glands infiltrated with caseous matter, which may be rocked to and fro upon a base of degenerated cellular tissue, with a margin of blue undermined integument.
 - b. Encapsulated tumours which have resisted the treatment by injection.—*Lancet*, Sept. 4, 1875, p. 341.

AFFECTIONS OF THE EYE AND EAR.

66.—ON SOME PRINCIPLES OF OPHTHALMIC THERAPEUTICS.

By R. BRUDENELL CARTER, Esq., Ophthalmic Surgeon to St. George's Hospital.

The influence exerted upon the eye by ordinary facial neuralgia is well known, and has of late been more carefully studied than at any former time. In nearly every instance of acute pain of the first division of the fifth, we find lacrymation and conjunctival hyperæmia of the affected side, and also

increased tension of the globe, which, if the pain recur frequently, is apt to be established as a permanent condition. This fact was first brought into prominence by Wegner, in the year 1866; and my own experience has assured me of the general accuracy of his observations. Nearly every case of glaucoma which I have seen in a comparatively young subject has had a history of antecedent neuralgia, not merely of ocular pain due to the increasing tension itself, but of paroxysmal pain in the whole region of the first division of the fifth; and nearly every patient who is subject to periodic facial neuralgia is conscious of, or will discover on observation, a marked clouding of vision on the affected side during the attack. I think, moreover, that the converse will hold good, and that, as a very general rule, anæsthesia of the fifth is associated with abnormal tension of the eyeball.

It is, therefore, not too much to affirm that we are familiar with grave changes of ocular nutrition, as ordinary results of remote nerve lesion, which may itself be situated either at the peripheral extremity of a nerve of the other eye, or on the ganglion of the nerve of the affected eye, or on the sensory trunk on the hither side of this ganglion, or at the unknown and presumably central seat of paroxysmal neuralgia. There is nothing improbable in the belief that this kind of influence is exerted more frequently than has hitherto been supposed; and clinical experience has long ago forced upon me the conviction that such is the case. I constantly see eye-disease, which cannot be referred to any known or definite local or constitutional cause, in which the pain or other nervous symptoms are in excess of the local lesions, and which resist the treatment that at first sight seems calculated to be successful. In such cases, especially when they occur in persons who have a neurotic family or individual history, or who have been subjected to severe emotional or intellectual strain, I am accustomed to assume the existence of some remote nervous change, and to bring this hypothesis to the test of therapeutics. If I then succeed in curing the patient, I regard the truth of the hypothesis as being well-nigh proven. Take, for example, the various superficial corneal and conjunctival eruptions and ulcerations which were collectively described as "strumous ophthalmia" by old writers. We observe, in many of these cases, an element of extreme nervous irritation, manifested as photophobia, which varies greatly in degree in different patients, and even in the same patient at different times, and which stands in no apparent relation to the quantity or character of the local tissue changes. More important still, we find a certain number of these cases which resist all the methods of treatment that are commonly successful, but

which yield almost immediately to the administration of arsenic—a medicine which acts upon many forms of neurosis with nearly as much certainty as quinine upon ague, and which almost establishes the general character and analogies of any malady that it cures. For an admirable sketch of the value of arsenic, especially from this point of view, I would refer to an introductory lecture by Dr. Clifford Allbutt, which was published in the *Lancet* in October, 1871.

Besides arsenic, the medicines which may be used to confirm a neurotic diagnosis in ophthalmic cases, are mainly quinine, iron, bromide and iodide of potassium, and morphia. The influence of quinine and iron upon neuralgia forms part of the common stock of medical knowledge; but I think it is less widely known that these remedies are far more efficacious in combination than when given singly; that they are far more efficacious in small and frequently-repeated doses than in larger ones separated by longer intervals, even though the same absolute amount may be taken; and that the certainty and celerity of their action may be much increased by the addition of a small quantity of morphia. I am indebted to my friend Mr. Gregory of Stroud for the knowledge that a pill containing a grain of quinine, two grains of potassio-tartrate of iron, and from a twelfth to a twenty-fourth of a grain of morphia, according to circumstances, and taken every hour until an expected paroxysm has been missed, will often cure periodic neuralgia with a rapidity and certainty not to be attained by any other method of administering the same medicines. I have also found this formula to be of the greatest possible value in many cases of eye-disease, in which local changes were progressing too rapidly to be overtaken by the use of a grain or two of quinine twice or thrice a day as a "tonic," but in which they were promptly arrested when the patient was brought under the influence of the specified combination.

The action of bromide of potassium upon the central nervous system, and probably upon the blood-supply of that system, is too well established, by its effect upon epilepsy and upon sleeplessness, to need any further remark than that some prescribers still give the salt in inefficient doses, taking ten grains as their average standard rather than twenty or thirty. But the iodide of potassium, on account of its great value in some of the later forms of syphilis, and on account of the large proportion of eye-disease which may be traced to a syphilitic origin, holds a somewhat less assured position as an anti-neurotic. Many practitioners believe that the beneficial influence of the iodide, in any given case, almost establishes its syphilitic character; but in this opinion I am unable to concur.

I think that iodide of potassium has a far wider range of usefulness than in syphilitic cases only ; that, like the bromide, it has a manifest influence upon the blood-supply of the brain, and that it cures maladies, such as recurrent, nocturnal headache, which cannot be traced to a syphilitic origin, or described as syphilitic except by an abuse of language. Like the bromide, the iodide is frequently given in doses which are well-nigh useless ; an error which perhaps arises from the circumstance that some patients are extremely susceptible to the action of the medicine. If we habitually order ten grains three times a day as a commencing dose, we shall find, in nearly all the cases in which the iodide is useful, that this dose may be rapidly increased to double or treble the quantity, or even beyond these limits. In some cases, doubtless, we shall find that the iodide does no good ; and in a few we shall find that it is useful, but at the cost of coryza and other troublesome symptoms. I am indebted to Mr. Hutchinson for the practical knowledge that, when the iodide is at the same time clearly indicated and badly borne, it is almost always possible, by reducing the dose, to obtain its advantages without the attendant evils. The patients concerned are persons who are abnormally sensitive to the medicine, but they are abnormally sensitive alike to its remedial and to its poisonous action. For them, therefore, we may possibly find that two grains, or one grain, or even half a grain, will do as much as ten grains for the majority of people ; and when we are told that a certain patient cannot take the iodide, or find by experience that he cannot take it in ten-grain doses without inconvenience, we should not on either ground abandon its administration, but should simply diminish the dose until we arrive at one that can be borne, and should then continue this until we see whether beneficial effects are likely to be produced by its employment. The principle of action is to begin with ten-grain doses, to increase them, by five grains or so at a time, if they are clearly useful, whenever there is any arrest in the progress of improvement, and only to diminish them in the few instances in which coryza or other indications of iodism are produced. That a few people are abnormally sensitive to the action of a medicine is a circumstance which does not justify us in giving this medicine to the many in an inefficient manner. When iodide of potassium is really wanted, the administration of five grains twice a day, or of three grains three times a day, is little better than allowing the disease to run its course unchecked.

The larger doses, it must be remembered, require some circumspection in the time and manner of administration. They are best combined with four or five grains of carbonate of ammonia, and freely diluted. I am accustomed to direct the dose to be taken about an hour before a meal, and to be imme-

diately preceded by half a tumblerful of barley-water, which will insure the necessary dilution with a bland fluid.

With regard to the use of morphia, or of other anodynes which may be better adapted to individual cases, it may be accepted as a sound general principle that no eye will get better while it is acutely painful; so that acute pain must always either subside or be subdued as a condition antecedent to recovery. Perhaps we might also say that a morbid state which is either originated or maintained by remote nervous irritation is not likely to improve in the absence of refreshing sleep. Premising that pain may be due to physical conditions—*e.g.* to increased tension of the globe, to the pressure of a displaced lens upon the iris, to the protrusion of iris through a wound, or to the presence of a foreign body—and that in all such cases the necessary mechanical treatment must be first applied, and may prove to be all that is needed, we may say that the object of using anodynes is to subdue pain and to procure sleep; that for these purposes they must be given, if necessary, in repeated doses at regular intervals; and that they must be measured less by quantity than by their effects. It is seldom necessary or desirable to give anodynes for the moderate amount of pain which usually follows an operation, and which may be expected to subside in an hour or two; nor must we expect to render a diseased or injured eye free from sensations of discomfort. Such sensations are inseparable from abnormal conditions when the nerves themselves are healthy; and in feeble persons there is no less favourable symptom after a cataract operation than a total absence of pain or discomfort. Such an absence usually points to a torpor of the nerves, which is itself incompatible with speedy healing, and is a common precursor of an unsuccessful issue. But severe or long-continued pain indicates, and assists to maintain, a state of nervous irritation which is at least equally incompatible with repair, and which it is always necessary to subdue. Whenever acute or abiding pain is present in eye-disease, we have a reason for the addition of anodynes to any other treatment which is required, and this addition should be made in an effectual manner, by giving to the patient or nurse the means of repeating the dose, if necessary, at stated intervals, until the desired effect has been obtained. It will not do to be content with administering a dose of morphia hypodermically in the evening, or with prescribing a pill to be taken at bedtime. Provision should be made for the continued administration, say of a quarter of the original quantity, hour by hour, until pain is subdued or sleep produced. There are certain forms of iritis in which the acuteness of pain is a very

prominent symptom; and it was chiefly in cases of this class that the late Mr. Zachariah Laurence succeeded, some years ago, in bringing about a cure by the use of large doses of opium or morphia alone. He kept his patients in a state of semi-narcotism for several days, or until all symptoms of acute inflammation had subsided. His original paper in the Edinburgh Medical Journal is still interesting; but it was written at a time when the importance of preventing adhesion of any part of the margin of the pupil was not sufficiently understood; and it is probable (the point not being mentioned) that many of his cases, although dismissed from treatment as cured, were left with synechiæ which could hardly fail to excite recurrent attacks of inflammation.

Ophthalmic Diseases of Constitutional Origin.—If we consider the ophthalmic affections which are of constitutional origin, we are necessarily confronted in the first place by syphilis, the most far-reaching and the most-widely diffused morbid poison of which we have any knowledge. We shall scarcely see a single case of eye-disease, as distinguished from defects of shape or of function, in which we shall not have to weigh the question, "Is this syphilitic?" and the number of instances will be very large in which the balance of probability will incline to an affirmative reply. If we include all its known forms, syphilis attacks every important structure of the eye directly—the cornea, the iris, the retina, the choroid, and the vitreous, being all the common seats of distinctly syphilitic affections. It also attacks the eye indirectly, as when syphilitic paralysis of the third nerve produces ptosis, or when syphilitic paralysis of the fourth or sixth produces double vision, or when syphilitic paralysis of the fifth nerve produces (as we have seen) corneal opacity or ulceration, or when syphilitic tumours in the brain produce the changes which have been miscalled optic neuritis, with the attendant liability to consecutive atrophy and blindness. The question of the diagnosis of syphilis is one upon which it is not necessary here to dwell, further than to say that, from various social and domestic reasons, and on account of certain obvious temptations to untruthfulness, it is often beset with great difficulty, while, at the same time, it may be absolutely necessary for the surgeon to arrive at some definite conclusion with regard to it. The occurrence of iritis in one eye of a previously healthy young woman, soon after her marriage to a man who is very likely to have contracted syphilis, but who denies having done so, is perhaps as good an example as can be found of the practical bearing of an oftentimes insoluble problem. In such a case, it is generally a simple matter to cure the iritis, whatever may be its nature; and, supposing it not to be syphilitic, there will be an end of the difficulty. But

if it should be syphilitic, the patient, when her iritis is cured, will only have completed the first link in a long chain of morbid action, likely to entail suffering, and perhaps premature death, upon herself, and to be continued to the next generation in her children. From such a fate she may be rescued if the surgeon can say that the affection of the eye is an expression of a constitutional malady, and can induce her to submit to the treatment necessary for its cure. When certainty is not attainable, high probability must be accepted as a guide, and it is better to be content with high probability than to enter upon inquiries which may be productive of domestic unhappiness; always remembering, however, that the patient should have the benefit of a doubt in this sense,—that to overlook natural syphilis is, in practice, perhaps the most serious of all errors, while to suspect it when it is not there, and to act upon the suspicion discreetly, is an error indeed, but one which may relatively be described as trivial. The nature of the case renders it incumbent upon every practitioner to cultivate, in the highest possible degree, the faculty of recognising the external signs of syphilis, so that he may be able to form a diagnosis independently of history. It is not sufficient to know that syphilitic eruptions usually leave copper-coloured stains; but all the effects of the disease should be studied with the sort of care which was bestowed upon symptoms by the physicians of an earlier day, before the multiplication of instruments of diagnosis had produced our own comparative independence of the art of personal observation. Whoever, in dealing with declared syphilis, leaves nothing unnoticed, will often come upon the track of the undeclared as an Indian recovers a trail in the wilderness, by signs which cannot mislead, but which are too slight to engage the attention of less cultivated faculties.

The worst manifestations of ocular syphilis which have fallen under my own notice have occurred in patients in whom the primary disease had been recognised, but who had been lulled into a false security after an inadequate period of treatment, which had indeed removed local symptoms, but had left the constitutional malady untouched. A few years ago, more than at present, it was the custom for surgeons to begin the management of syphilis well, and to stop prematurely in the midst of their well-doing. A man contracted a chancre, and his inguinal glands became indurated. He was treated with mercury for perhaps six weeks, or until the chancre had healed and some trivial secondary eruption had appeared and faded, and then he was allowed to lay aside the medicine. He was told that he might or might not have further secondary symptoms; and that, if they appeared, it would be sufficient to treat them with iodide of potassium. The great debt of gratitude

which the world owes to Ricord has been materially enhanced by his long life, which has enabled him to witness the end of things, to watch over his patients from their adolescence to their old age; and to see, in many cases, the manhood of two generations of their descendants. From the evidence gathered during an experience which is nearly as unparalleled in its duration as in its extent, he tells us that syphilis is radically and permanently curable, but that it cannot be cured, as a rule, otherwise than by a course of mercury continued, with due intermissions and precautions, for something like twelve months. Less than this will, indeed, in most cases, leave the patient apparently well, but the disease will again declare itself at some future time, and often in some of the obscure forms the nature of which we have only just learned to recognise.

In 1857, a young gentleman, reading in London for his army examination, contracted a venereal sore, and wrote to me for advice about it. I was then living in the country, and I told him to go to an eminent hospital surgeon, and to pay implicit obedience to his directions. The sore was pronounced to be a hard chancre, and mercury was given in the way to which I have just referred. After a few weeks it was discontinued, and patient and doctor were both satisfied. The former obtained his commission, and went to India with his regiment. He was a keen sportsman, and after snipe-shooting in some marshes was attacked by what was called rheumatism, and was sent to England. Here he recovered, and went to Aldershot on duty; but was again attacked, and was sent away from the camp to his father's house, where he had been lying in bed for a month when I was asked to see him. Many of his joints were swollen and tender, and he was quite helpless. I told his medical attendant of the chancre, and we agreed to lay aside all other treatment in favour of iodide of potassium. In a week our patient was riding about on horseback, and he soon returned to duty. A year or two later his syphilis showed itself again, this time by occlusion of a cerebral artery and consequent hemiplegia; so that this gentleman, not twenty-five years of age, was crippled and disabled for life. Such a history is common enough; but any individual practitioner usually sees only a part of it, and the part which chiefly falls under my observation is the cropping up of syphilitic disease of the retina or choroid, or of brain tumours producing secondary mischief in the eye. Quite lately a gentleman came to me with loss of central vision in one eye; and the ophthalmoscope showed a patch of disease over the region of the macula lutea. I expressed a belief that it was syphilitic, and inquired his history. Three years previously he had contracted a chancre, and had been treated for it in Ireland, by an eminent surgeon now deceased. At my re-

quest he wrote to the druggist who prepared his medicine, and obtained copies of the prescriptions, with the dates at which they were made and repeated. It appeared that he had been under mercurial inunction for a fortnight, and that then he had taken small doses of the perchloride for four weeks, making six weeks of mercury in all; and this was the result. Analogous cases present themselves every day to those who will take the trouble of tracing out a chain of antecedents.

The instances in which we are led by iritis to the discovery of an early stage of syphilis present no difficulty with regard to treatment, except such as may arise from the incredulity or the circumstances of the patient. We have but to cure the iritis in the ordinary way, and to apply to the syphilis the principles which Ricord has so clearly stated. If the patient will not take mercury for the necessary time, so much the worse for him; and if he is forewarned of the probable consequences, the surgeon is relieved of all responsibility. That the mercury should be cautiously given, and in such a way as to avoid the production of its poisonous effects, is a matter of common sense on which it is unnecessary here to dwell.

When the period of primary syphilis has long passed away, and when mercury has been given for a few weeks, as in the cases above cited, it is much more difficult to decide upon the course to be pursued. We have, then, two remedies between which to choose, mercury and iodide of potassium. Of these, iodide of potassium is the more rapid in its influence upon the symptoms actually present, but it probably possesses little or no power to modify the systemic malady. Nothing in clinical history is more remarkable than the rapid amelioration of the symptoms of late forms of syphilis under the use of the iodide; nothing is more certain, generally speaking, than their recurrence in the same or in some modified form. Mercury, on the other hand, will be slower in producing its first action, but more effectual as against the syphilitic taint; although it is not proven that syphilis of long standing can be cured by mercury, at least with anything like the same certainty as the earlier stages of the disease. It is in the eye, however, that the immediately curative effects of mercury are most remarkable; and it is from its visible action upon iritic effusions that many inferences have been drawn with regard to its supposed kindred action in parts of the body that are concealed from view—as, for instance, in the pleura. I am indebted to my lamented friend the late Dr. Anstie for the suggestion that these inferences may possibly be in some degree erroneous. He believed that mercury has some special elective affinity for, or special action upon, the parts which are supplied by the fifth nerve, and did not admit that its manifest influence upon iritis is

necessarily an evidence that it will exert a similar or equal influence elsewhere. In support of this view it may be said that the poisonous effect of mercury is displayed first upon the gums, which derive their nerve supply from the source indicated; and we may also find something analogous in the deposition of lead in the gums, coupled with its tendency to produce atrophy of the optic nerves. The suggestion is one upon which I need not dwell, but it will serve to call to mind the powerful effect of mercury upon the eye, as well as the possibility that the argument from the eye to other organs may be fallacious. Returning to the question immediately under consideration — the choice between mercury and iodide of potassium — it may, perhaps, be said that the best rule of practice is to inquire whether the local changes in actual progress are such as to inflict irreparable injury unless they are speedily arrested. If they are, iodide of potassium should be given in the first instance, and should be continued until a distinct impression is made upon the case; when it may be laid aside, and mercury given instead of it, with the hope of anticipating subsequent phases of mischief. If the changes in progress are not of this pressing character, it may often be best to give mercury from the first. A corneal ulcer threatening to spread or to perforate, so that in two or three days it might permanently impair the eye as an organ of vision, or an amount of effusion in the nerve disc likely to lead to speedy atrophy by its interference with the local circulation, would either of them call for the most rapid influence that the iodide could afford. A mere haziness of the cornea, or a turbidity of the vitreous body, or a limited amount of retinal or choroidal change, may be taken to illustrate conditions in which it would be legitimate to wait for the more gradual operation of mercury.

The mode of administering iodide of potassium has been already described; and, concerning the administration of mercury, there is nothing to be said which has any special application to the eye. The skill of modern pharmacutists has multiplied preparations; but by these I have not been tempted to forsake old and trusted friends. Sir Astley Cooper was wont to tell his pupils that if they were much addicted to new remedies two results would inevitably follow: first, they would not cure their patients; secondly, they would have no patients to cure. For the most part, I am accustomed to gain a knowledge of new remedies chiefly by reading or hearing the accounts given of them by others; and I feel that the weapon which I have learnt to use is that which, in my own hands at least, is most likely to do good service. In order to obtain a mercurial influence quickly, I use either blue pill, or inunction with blue

ointment, or both together ; and, for prolonged administration, the perchloride. Inunction is often useful for adults, but its especial value is in the case of young infants suffering from a combination of purulent ophthalmia and inherited syphilis. For them, the plan I prefer is to smear every day a little fresh ointment on a strip of flannel, about an inch and a half wide, which is buttoned round the abdomen, next the skin, and worn constantly. Mr. Hutchinson is accustomed to have the ointment rubbed into the soles of the feet, the only part of an infant's skin on which it never produces irritation. To this there are no other objections than the trouble of protecting the hands of the rubber, and the ill-consequences which may follow if the protection should be incomplete. Together with the pill or the inunction, except in the case of infants, it is wise to employ a little opium to check griping or purgation ; and the perchloride combines admirably with iron, or quinine, or arsenic, or with any two of them, and is generally more effective in combination than alone. To this armamentarium I am beginning to add a new remedy which is of sufficiently good repute to deserve a trial—namely, Staub's chloro-albuminate for hypodermic injection ; but I cannot yet speak of it from an experience large enough to form the foundation of an opinion. Calomel, with precautions and under conditions that will be described when discussing the diseases of the cornea, is often useful as a local application ; but, given internally, it has no advantage over blue pill, and the calomel-vapour baths, so much extolled by my esteemed colleague, Mr. Henry Lee, have appeared to me to be somewhat uncertain in their operation, and, sometimes, to be too energetic. For these reasons they fail to fulfil what I regard as essential to a good method of mercurial treatment—namely, that the surgeon should hold the reins of it in his hand. We are much indebted to Mr. Haynes Walton for the force and clearness with which he has pointed out the boundary between the remedial and the poisonous action of mercury ; and this boundary the prescriber should never transgress. Save in the exceptional cases of idiosyncrasy, in which mercurial poisoning may be produced by a single moderate dose, there should be no such thing as a sore mouth resulting from treatment. The slightest line upon the gums indicates a point beyond which the medicine should not be pushed ; and the highest art of administering mercury is to keep the patient, as it were, on the brink of this line, without permitting transgression of it. For this purpose, the inexperienced practitioner must be content to feel his way ; and the most experienced will constantly find that he can do little more.

The other forms of constitutional malady which entail pro-

clivities to eye-disease are chiefly gout, rheumatism, albuminuria, and diabetes; and there is little to be said concerning them beyond the obvious caution that they must not be overlooked, and that the general treatment which any of them, when present, would require, must be combined with the local treatment which the affection of the eye may render necessary. Again, there are certain temporary states of system which would materially affect both the prognosis and the treatment of ocular disorders apparently identical in their nature. A hemorrhage in an eccentric portion of the retina, occurring in a woman whose whole circulation was deranged at the period of the menopause, would call for little more than the ordinary precautions of the time; while a similar hemorrhage in a man of the same age would suggest extensive disorder of the arterial system, and would, in all probability, be the precursor of renal disease or of apoplexy. Hence it is always necessary to inquire, in any case of eye-disease, not only with regard to the presence or absence of what may be called the greater forms of dyscrasia, but also, generally, "What is there lying behind this local change?" The inquiry becomes especially important in the case of patients who are passing from middle life towards old age, but there is no period at which it can be neglected with impunity. Appetite, diet, exercise, sleep, the tone of mind, the nature and amount of work, the character of the atmosphere habitually inhabited, and the balance between waste, repair, and supply, as shown by the state of the excretions, should all be systematically inquired into. A patient cannot make a speedy and satisfactory recovery if he is underfed or overfed, if he leads an unduly sedentary life in vitiated air, if his brain is overworked or harassed by emotions or anxiety, if his sleep is insufficient, or if his system is loaded with waste which his excreting organs fail to remove. Neglect of these conditions is not an uncommon result of too early a devotion to specialism on the part of the practitioner; and, in its effect upon the patient, is a fruitful parent of chronicity and of relapse.

It must not be inferred from the foregoing observations that the local treatment of eye-disease is to be neglected, or that it is unworthy of the closest and most careful attention. On the contrary, whatever may be the background, so to speak, of remote or of constitutional causation, and however necessary it may be that this background should be modified by circumstances or removed by art, yet still, in all the maladies of the parts anterior to the crystalline lens—that is, of the iris, the cornea, or the conjunctiva—the character of the local treatment will usually determine the degree of excellence of the local

recovery. An eye is liable to be spoiled, for visual purposes, by even a brief continuance of certain morbid processes; and it is, therefore, the business of the surgeon to terminate these processes as rapidly as possible. Their gravity may be due solely to their situation; and, just as a degree of inflammation which would be trivial in any other part of the mucous membrane may destroy life when it occurs in the larynx, so an ulceration, which would elsewhere be left to run its course, may destroy vision when it occurs upon the cornea. If a patient has a syphilitic ulcer of the leg, we need take little trouble about local applications, knowing that it will heal under the influence of rest and of anti-syphilitic internal medication. But if he has a syphilitic ulcer of the cornea, we must remember that the difference between judicious and injudicious local treatment will determine whether or not it shall extend or deepen for two or three days longer than it need; whether or not it shall perforate; whether it shall leave a mere temporary nebula, or a cicatrix disfiguring to the appearance and disturbing to the sight. In vascular inflammation of the cornea it will depend, in great measure, upon local treatment, whether or not the curvature of the membrane shall undergo injurious modification. In iritis it will depend upon local treatment whether or not the pupillary magin shall be left adherent to the lens. Lastly, in many of the more acute forms of conjunctivitis, it will depend upon local treatment whether or not the cornea shall escape injury, and whether the malady shall be cured in a reasonable time, or shall lapse into a stage of absolutely indefinite duration and of infinite possibilities of mischief. While, therefore, we must neither overlook nor neglect to treat the systemic conditions on which affections of the eye may more or less depend, we must not place reliance upon constitutional treatment only, to the neglect of the various local applications by which the local malady can be conducted to a safe and speedy termination. Of the two errors, the less serious would be to neglect the constitutional treatment, because this neglect might often be repaired on some future occasion; while, on the other hand, a corneal ulcer suffered unduly to extend itself, or an iritis suffered to establish firm adhesions, may easily produce consequences which would be altogether irreparable.

On some Principles of Local Treatment of Eye Diseases.—There are certain principles of local treatment, of very general applicability, which it will save repetition to state once for all in this preliminary essay. In the uncovered eye, the lids are constantly passing to and fro over its surface, so as to remove particles of dirt deposited from the atmosphere, and to diffuse the tears and conjunctival mucus evenly over the globe. In

diseased conditions, when the conjunctiva and cornea are roughened by the projection of distended blood-vessels, and when the natural secretions are altered or diminished, and especially when there is any abrasion or loss of the corneal surface, the friction of the lids becomes not only painful, but injurious, and the movements are at the same time increased in energy and frequency by reflected irritation. It then becomes necessary that they should be restrained; and for this purpose we employ what is known as a "compressive bandage." This is composed of a small piece of fine linen to cover the lids, some carded cotton-wool for padding, and a roller, about an inch and a half wide and nearly two yards long, formed of any fine elastic material, but preferably either of what is called "water-dressing bandage" or of flannel gauze. The free end of the roller should be placed on the forehead, over the affected eye, and the first turn should be made across the forehead and round the head horizontally, so as to secure the end. When the roller reaches the forehead, over the sound eye, for the second time, it should be inclined downwards, carried under the lobe of the ear, round the occiput, under the lobe of the second ear, and then upwards across the face, over the affected eye, to the forehead. Before the roller is brought over the affected eye, the small piece of linen should be placed upon the closed lids, and all the hollows of the orbit should be filled and padded with the cotton-wool, in sufficient quantity to allow the roller to exert distinct but gentle and uniform pressure on the parts beneath. When the roller reaches the forehead, it should be secured to the horizontal turn with a pin, and then a second horizontal turn over all will complete the application. By varying the quantity of wool and the degree of tightness of the roller, any desired amount of pressure may be exerted by this bandage, which, if carefully applied, is very little liable to be displaced. Too much care cannot be taken in filling the orbital hollows, and in so distributing the wool that its pressure may be uniform, because if a bunch of wool were simply applied to the lids over the convexity of the globe, and then bound tightly on, the effects of such a proceeding might often be disastrous. For a patient who is able to walk out, and who objects to the white bandage as being unsightly, a tolerably efficient substitute may be made by a double piece of soft black silk, six inches long and an inch and a half broad, neatly hemmed, turned in to a point at each end, and having three-quarters of a yard of narrow soft black ribbon sewn to each point. The silk may be placed obliquely over the carded wool, with one point coming to the temple on the sound side, the other under the lobe of the ear on the affected side. The ribbons may then be brought to meet at the occiput, crossed

there, brought horizontally round the head, and tied in front, or over one ear.

There are many circumstances under which it is desirable to apply cold or heat to the eye; the former to moderate, the latter (as in the case of sloughing ulcers of the cornea) to promote vascular action. For these purposes we employ compresses of various kinds. For cold, the compresses should be of fine linen, about two inches long by an inch and a half broad, smoothly and evenly folded, and composed of from four to six thicknesses of material. Half a dozen or so being prepared, they should be steeped in a basin of cold water, in which, if desirable, a lump of ice may be floating, and which should be placed close to the patient. The nurse takes out the first compress, squeezes it in her fingers just sufficiently to prevent water trickling from it when it is applied, and places it gently over the closed lids. In a time varying from one to five minutes, according to the heat of the part and the effect desired, the compress should be exchanged for a second, the first being replaced in the iced water. The object of having several in use at once is that, by taking them in regular rotation, each may have time to become perfectly cold before it is reapplied. If the water be hard, and the skin of the eyelids delicate, it is well to apply a little olive or almond oil to the latter, to prevent superficial irritation.

For the application of heat the flat compress is less effectual than something lighter and more bulky; and for this purpose small sponges may be employed, wrung out of hot water in a similar manner. Von Graefe was accustomed to use hot camomile fomentations, and to apply them by means of little muslin bags, in which a few camomile flowers were sewn up prior to being boiled. Each bag, as it was taken from the eye, was returned to the decoction to recover its temperature; and it is obvious that, whether water or some medicated decoction is employed, it must be kept hot during the whole period of application, either by a spirit-lamp or some similar contrivance, or by additions of fresh hot liquid from time to time. As a rule, neither heat nor cold should be applied to the eyes continuously for any long period; and an hour, twice or thrice a day, will usually be enough for either. In the intervals the compressive bandage should be carefully adjusted.

The bandage, by excluding light and by preventing movement, affords a considerable degree of rest to the eye, and thus places it under conditions favourable to recovery. But, in order to obtain complete physiological rest, it is necessary to have recourse also to atropine, which paralyses for a time both the ciliary muscle and the sphincter of the pupil; and thus establishes absolute internal relaxation and passivity of the

organ. Furthermore, on account of the close functional union and sympathy which exists between the eyes, it is necessary, whenever one is seriously affected, to enforce entire rest of its fellow—that is to say, to enjoin abstinence from reading, writing, or any other pursuit requiring visual application, as well as avoidance of exposure to dust, cold winds, heat, or glare.

The use of atropine for the purpose above mentioned is best accomplished by a solution in distilled water of the neutral sulphate, of the strength of two grains to the ounce. This solution, if the drug be pure and neutral, is absolutely unirritating to most eyes; and a drop may be placed in the lower conjunctival fold, near the outer canthus, two or three times a day. For the purpose of making the application, there is nothing better than a goose quill, cut to a blunt scoop; but, considering the highly poisonous nature of the solution, it is perhaps safest to send it out in special bottles, with a dropping apparatus attached. Various contrivances have been devised for this purpose; but the best of them is a little blown-glass bottle. By heating the bulb of this bottle slightly in the flame of a spirit-lamp, the contained air is caused to expand; and then, by inverting the bottle, and dipping its beak into the solution, a sufficient quantity will be driven through the capillary opening by atmospheric pressure. In use, it is only necessary to invert the bottle, to hold it in the warm hand, and to touch the lining of the lower eyelid with its beak, from which a drop will issue.

If the application of atropine should be painful, the most probable explanation is that the drug is impure or not neutral, or that sulphuric acid has been either set free by spontaneous changes, or added by the dispenser to obtain a clear solution. In such case, no time should be lost in obtaining a fresh supply. But when atropine has been long in use, the best preparation is apt to cause local irritation in some persons, and this irritation is usually more manifest in the eyelids, and especially on the lower lid, and on the adjacent skin of the cheek, than elsewhere. It may be readily recognised by a peculiar stiffness and dryness of the inflamed skin; and the swelling of the eyelid is usually sufficient to remove the lower lacrymal punctum from contact with the globe, and thus to produce an overflow of tears. Under such circumstances, the atropine must be laid aside, and some soothing application made to the closed lids. The best is, I think, the compound ointment of subacetate of lead of the British Pharmacopœia, which may be applied to the skin freely, and a soft bread-and-water poultice laid over it. But it is a rule without exception that no preparation of lead should enter an eye when there is any loss of corneal epithelium; because

we are then liable to have on opaque deposit of carbonate of lead formed upon the surface. If the corneal surface should be ulcerated or abraded, it is the safest practice not to let lead come into use, even as an external application, for fear of mischance; and in such cases I prescribe for the atropine irritation a simple ointment, into which a little sedative solution of opium has been stirred—perhaps in the proportion of half a fluid drachm to an ounce of ointment. There are some persons, however, by whom no preparation of atropine or of belladonna can be borne even for a time; all of them alike producing an erysipelatous inflammation. Such instances are rare; but there are few writers on ophthalmic surgery who do not record one or more from personal experience, and I have myself met with two of them. It is unnecessary to say that such an idiosyncrasy places a most formidable obstacle in the way of treating iritis and various other affections.

In the case of children, and especially the children of the poor, who are often roughly handled by their parents, and who have not learnt to trust to them, the proper application of atropine is sometimes a matter of considerable difficulty; and the solution is very apt to be washed out, or at least diluted, by tears. At hospitals we constantly see children for whom atropine has been prescribed, but whose pupils are not dilated. Occasionally, perhaps, no one at home has taken any trouble about the matter; but more frequently, I believe, the drops have gone over the cheeks, or anywhere but into the eyes, or they have been applied so roughly as to produce plentiful crying. In hospital practice such children can be brought every day, so that the application may be made effectually; and it will often be desirable to use, instead of the solution, the little wafers of atropinised gelatine which were devised by Mr. Streatfeild. I do not like these wafers for common use, because they often produce too much smarting; but for crying children they have a great advantage in the fact that they dissolve slowly, and that the medicament is not liable to be at once washed away by a gush of tears.—*St. George's Hospital Reports*, vol. vii., p. 98.

67.—REMARKS ON THE OPHTHALMOSCOPIC APPEARANCES MET WITH IN INTRACRANIAL DISEASE.

By C. HIGGENS, Esq., Assistant Ophthalmic Surgeon to Guy's Hospital, London.

Optic neuritis, and choked disc (*ischæmia*), are two conditions which are very frequently confounded; both are met with in association with intracranial disease, but differ from

each other in some essential particulars, both objectively and, in their subjective symptoms.

It is not intended for a moment to infer that optic neuritis and ischæmia are caused only by disease within the skull, as such is not the case; moreover, intracranial disease may occur without any change visible by the aid of the ophthalmoscope. But should optic neuritis or ischæmia be found affecting *both eyes simultaneously*, very strong evidence of lesion within the cranium is afforded, even though no subjective cerebral symptoms be present.

Let us now consider, first, what are the signs by which neuritis may be distinguished from "ischæmia" or choking of the disc; second, what are the cases in which each is likely to be met with, or rather, what form of intracranial disease should we expect to find associated with an inflamed or simply a *choked* condition of the optic discs.

The following are the principal ophthalmoscopic appearances by which neuritis may be distinguished from ischæmia:

Neuritis.

The disc is grey, opaque, and somewhat swollen.

The retina for some distance around the disc is swollen and infiltrated with grey and opaque inflammatory material.

The retinal veins are enlarged and tortuous, the arteries being smaller than normal; the number of visible vessels is less than in health, and many of them are shrouded and concealed from view in parts of their course by the inflammatory exudation.

Ischæmia.

The disc is red, resembling the surrounding choroid in colour greatly swollen, projecting considerably into the vitreous chamber, its area being also increased; its transparency, however, is only slightly affected.

The retina around the disc is only affected to a slight extent, and is not opaque, but simply oedematous and swollen.

The retinal veins are enormously distended, and their visible number is increased; the arteries are small; none of the vessels are shrouded and concealed entirely from view in any part of their course, but portions of them may appear darker or lighter, according as they lie near the surface or deeply in the substance of the oedematous portion of retina. A bend will also be noticed in the vessels where they pass over the border of the swollen disc.

Both in neuritis and ischæmia hemorrhages may exist on the surface of the disc or in the surrounding retina.

The great subjective distinctive symptom is, that in neuritis vision is always much impaired, whilst in ischæmia little or no want of sight is complained of.

I am sometimes asked why it is that a patient apparently suffering from double optic neuritis complains of no defect of vision; my answer is that the case is not one of neuritis, but of ischæmia.

The cases of intracranial disease which come before me as an ophthalmic surgeon, have all more or less impairment of vision,—on account of which I am consulted. On examination I find either optic neuritis or its sequel, atrophy of the disc. But if I examine cases in the medical wards, I often find ischæmia of both discs in cases where there is no want of sight.

In order to account for the loss of vision in neuritis and its non-impairment in ischæmia, it is necessary to understand the morbid changes which take place in the optic nerves in each. In neuritis the inflammation usually commences in the intracranial portion of the nerve, extends along its trunk, and at length becomes manifest in its intraocular portion (the optic disc). On microscopic examination, the trunk of the nerve, the optic disc, and retina immediately surrounding it, will be found infiltrated with inflammatory material, which necessarily gives rise to more or less impairment of function.

Neuritis is caused by irritation of the nerve trunk, from direct pressure upon it, or more commonly from its implication in some inflammation of the structures next which it lies.

In "ischæmia" the trunk of the nerve is not affected, but only its intraocular portion. The condition arises simply from obstruction to the return of blood from the eyeball, causing venous hyperæmia, which once set up is liable to be increased by the pressure of the unyielding sclerotic ring, through which the optic nerve and blood vessels pass.

As a consequence, the head of the optic nerve becomes *strangled*, exudation of serum takes place from its vessels, and the condition known as ischæmia, or choked disc, is established. In other words, there is dropsy of the optic disc and immediately surrounding retina.

Now, the mere fact of the nerve fibres being somewhat compressed by the sclerotic ring, and soaked in fluid, is not sufficient to prevent the normal conduction of impressions formed on healthy portions of the retina, *e.g.*, on the yellow spot: consequently no impairment of vision need occur in simple ischæmia, although the ophthalmoscopic appearances are such as to attract the attention of the most casual and inexperienced

observer. Secondary inflammatory or atrophic changes may follow upon ischæmia, and then vision becomes impaired. We now come to the second question.

Optic neuritis, as before stated, commences in the trunk of the nerve behind the eyeball, and is caused by direct irritation. I would therefore suggest that, in cases where the ophthalmoscope shows inflammation of the optic disc, some disease about the base of the brain or skull, such as meningitis, periostitis, or caries should be suspected.

Ischæmia depends upon and is a visible sign of obstruction to the return of venous blood from the eyeball, and may be caused, I think, by any intracranial affection, tumour, &c., which gives rise to *overcrowding* of the contents of the skull, or possibly by any disease which causes permanent congestion of the head.—*Guy's Hospital Reports*, 1875, p. 315.

68.—ON OBSTRUCTIONS OF THE LACHRYMAL SAC AND NASAL DUCT.

By W. SPENCER WATSON, Esq., Surgeon to the Great Northern Hospital, London.

A considerable number of cases of obstruction of the lachrymal sac and nasal duct are due to temporary causes, mere congestion or œdema of the mucous lining being the most common, but plugging with inspissated mucus being also an occasional cause of the obstruction. Such cases may often be relieved by the simplest possible treatment, or get well spontaneously; but if they have remained unrelieved or neglected they may pass into the condition of permanent obstructions, and these will almost always require treatment by the use of instruments.

Permanent obstructions occur under a variety of circumstances—as, for instance, in congenital absence of the nasal duct, which is said to have occurred in a case recorded in Forbes' "Review" (xii., 641), and in which M. Berard succeeded in making a communication with the nose direct through the lachrymal bone; or in the cases of bony deposit, whether from chronic periostitis, exostosis, or as the result of injury, as in the case recently brought before the Society, in which an injury to the face had distorted the nasal bones and obstructed the passage of tears. It is better under these circumstances to abandon all attempts at restoring the natural channel, and to force a passage through the inner wall of the lachrymal sac and the os unguis. This has been effected with very excellent results. Some difficulty is experienced in such cases in keeping the new aperture patulous, but the daily passing of a probe, or

the use of a soft silver or leaden style for some weeks will generally succeed. The permanent strictures, whether of the sac or nasal duct, most commonly met with are the results of the acute inflammatory attacks, known as lachrymal abscesses. The lining membrane of the sac and duct become thickened in the course perhaps of chronic catarrh, or by an acute congestion, the flow of tears is at once delayed, mucus accumulates, and the channel is completely obstructed. Inflammation of the sac follows, an abscess forms and bursts on the cheek. Henceforth there is a permanent stricture, and probably a fistulous opening on the cheek besides. Treatment in the very early stage of threatening abscess may sometimes arrest its progress; but the best prospect of success is derived from treatment of the precedent catarrh. Though, however, stricture of the lower part of the sac at its junction with the nasal duct is thus the result of abscess, it is probably in many cases its exciting cause, the retention of secretions within the sac due to an obstruction being sufficient to excite acute inflammatory action.

I have spoken before of the benefit sometimes obtainable by the use of injections into the sac when combined with constitutional treatment in simple temporary obstructions; but if simple treatment is not speedily followed by relief, it is always better to resort to the use of the probe, and as a preliminary to slit open the lower canaliculus. It is obvious that the longer the obstruction remains unrelieved the greater will be the danger of irritation of the sac from retained secretions, and the greater the risk of lachrymal abscess with all its attendant evils and subsequent ill effects; while the sooner the lower canaliculus is laid open, even though it may not be necessary to use probes to the duct, the greater will be the facility in emptying the sac by pressure with the finger, and of applying astringent or stimulant lotions to its lining membrane by means of the syringe. A further means of checking the tendency to abscess is counter-irritation by the use of tincture of iodine applied by means of a camel's-hair pencil over the skin between the nose and the inner canthus, care being taken that the tincture does not run into the eye itself.

Obstructions in the nasal duct may be caused by inflammatory thickening in the course of catarrhal, strumous, or syphilitic affections of the Schneiderian membrane, and may be seated (1) at the junction of the sac and upper extremity of the duct, (2) in the middle of the duct, or (3) at its lower extremity. The usual effects of obstruction—*e. g.*, overflow of tears and mucus, and subsequent formation of mucocele—will ultimately present themselves, and clinically the features will be the same as those of chronic dacryocystitis. But obviously treatment directed to the lachrymal sac alone will fail to remove the

causes of the mischief. Before the formation of a distinct mucocele it may be possible to check the progress of the disorder by the application of stimulant vapours to the nostrils. The use of a mixture of carbolic acid, spirits of wine, and ammonia, by way of inhalation, sometimes succeeds in relieving the congested state of the Schneiderian membrane, exciting a more fluid secretion, and thus removing the obstruction. Stimulant powders, such as scented snuffs, will answer the same purpose when employed in the very early stages of the disorder.

In the event of our failure in the treatment by these simple measures, we must proceed to the use of the probe. I do not restrict myself to the use of any special form of probe for these cases. In a case of simple obstruction, after laying open the lower canaliculus, I employ at first the full-sized Bowman's probes, using, however, a smaller one if that first used fails to pass, or is held tightly within the stricture. It is a good rule to use the large probe first in all cases, there being much less risk of tearing the mucous membrane with the large than with the smaller instruments. A probe with a bulbous end is still safer in this respect. Having passed the probe, it should be left in for ten minutes or a quarter of an hour, in order that it may excite by pressure some amount of increased action in the part. It will be well to ascertain after passing it whether we have placed it in the right position. If it is lying in the lachrymal sac and nasal duct, it will be found that its free end is resting against the upper margin of the orbit, in a line which passes through the centre of the tendo oculi, and cuts the interval between the second incisor (upper) and its corresponding canine tooth below, and the inner extremity of the eyebrow above. This line nearly corresponds to the line of the superficial furrow between the ala of the nose and the cheek. The upper end of the probe should be directed obliquely forwards as well as inwards. Having passed the full-sized probe several times, there is generally a marked improvement in the symptoms; but if not, injection of the sac with some astringent collyrius should be combined with the dilatation with probes; and in this way a cure may almost always be effected in a very short period. But every now and then very obstinate cases are met with—generally old neglected instances of lachrymal abscess, with fistulous opening on the cheek, in which the lining membrane and the bones themselves have become thickened by chronic inflammation. The mucous membrane in these cases is sometimes as stiff and hard as cartilage; and even though a good-sized probe may be passed, the constriction remains, and the epiphora constantly returns.

In these cases I employ Stilling's method, and have been very well satisfied with the results. In order to perform this opera-

tion effectually, the patient, unless of very heroic temperament, should be put under the influence of chloroform. The canaliculus having been previously laid open, a probe is passed into the sac, in order to ascertain the seat and nature of the stricture. Stilling's knife being then passed at first horizontally, its point is turned downwards, the cutting edge held forwards, and then carried vertically downwards until it meets with the stricture. This is divided by turning the cutting edge against it in three or four different directions; next a full-sized conical probe is passed, with the intention of freely dilating the newly divided edges; and lastly a silver style introduced, and left in for a week or ten days, or until the discharge assumes a simply serous character. After the removal of the style it will be necessary to pass a probe about once or twice a week for several months, as there is a great tendency to the return of such strictures if neglected. It is important, in the treatment of such cases, to ascertain that the obstruction to the flow of tears into the nose is not due to acute periostitis, nor to the presence of necrosed bone. These conditions would be indicated by inflammatory redness, pain, and exquisite tenderness over the bones and cartilages of the nose, and of course the operation described would be entirely unsuitable, or even mischievous, when such a set of symptoms present themselves. Various instruments have been devised for division of strictures of the nasal duct; among others the guarded canula-lancet (Bowman's) may be occasionally useful; but, in the majority of cases, the operation can be better performed with the aid of Stilling's knife than with that of any other cutting instrument.

The soft virgin silver is the most suitable material for a style, and it should be made with a narrower portion at its upper end, which can be turned over the edge of the eyelid, and so retained in position. For hospital use the pure leaden style used by Mr. Green, of Philadelphia, answers extremely well. It is a good plan to use a rather thin style at first, and in a week to replace it by a larger one, until at the end of three or four weeks one of the size of a crow-quill may be introduced.

In very obstinate cases, or in neglected cases that have been of many years' duration, the larger the diameter of the style employed, the better the chance of a permanent cure.

In the case of threatening lachrymal abscess from any cause, probing is entirely out of the question; and if there be any periosteal tenderness, or any indication of bone mischief, the passing of probes can only be attended with increased destruction of tissue, and, even if succeeding necrosis be not really due to the probing, the patient, after having suffered the pain occasioned by it, will not fail to attribute his disasters to the manipulative interference of the surgeon.

These remarks do not apply to probing of the edges of the divided canaliculus, or of the edges of the divided walls of the sac, in cases of abscess, but only to the use of the probe in the way of dilating the obstructed channel into the nose. Syphilitic ulceration of the nasal cavities not uncommonly leads to abscess of the lachrymal sac and necrosis of the bones surrounding it. In these cases, above all others, probing of the nasal duct is to be avoided; and, on the other hand, an early opening of the abscess is most beneficial. Where an abscess has formed, there will be no difficulty in deciding as to the course to be followed; but it happens now and then that in the early stage the obstruction to the flow of tears is the most prominent early symptom, and it is in these cases that probing is likely to be used inadvertently. The diagnosis of a syphilitic taint will depend upon the usual signs, and especially upon the presence of ozæna or ulceration, with an offensive discharge from the nostrils. The history of the case will often assist us in arriving at a correct conclusion. Under circumstances indicating periosteal mischief—such as tenderness of the nasal bones, with nocturnal headache of a neuralgic kind,—leeches applied to the inside of the nares, and cold in the form of ice-bags externally, will give the best chance of arresting the disorder, if at the same time free doses of iodide of potassium are given internally, with opiates at night.—*Medical Times and Gazette*, June 5, 1875, p. 603.

69. — AN IMPROVED METHOD OF TREATING CERTAIN CASES OF CATARACT REQUIRING EXTRACTION.

By JAMES VOSE SOLOMON, Esq., Surgeon to the Birmingham Eye Hospital.

In some ophthalmic works which discuss the cure of senile cataract, the presence of a deep-set eye is given as a reason for the selection of depression or reclination in preference to the operation of extraction. I imagine no surgeon who has had experience in such cases will deny that a deep-set eye occasions some embarrassment in the making of the corneal section with a Graefe's or Beer's knife, especially where anæsthetics are not employed.

In a case recently operated upon at the Birmingham Eye Hospital, I improvised a simple and effective method of overcoming the difficulty under consideration by making with a pair of sharp scissors a perpendicular incision through the substance of the lower lid of about three-eighths of an inch in length and one-sixth of an inch from the commissure. Steady continuous pressure by means of a small sponge restrained the

bleeding within innocent limits. The front of the eye having been now made easy of access to the knife, the section of the cornea was completed without difficulty, and the lens safely delivered without accident. No anæsthetic was employed. The lid was not sutured, but dressed with cerate instead of dry rag, and two turns of a narrow doan roller. The patient, a collier of sixty-eight years, recovered without a single painful or unfavourable symptom, and was discharged cured on the fourteenth day of the operation, with a clear black pupil, good vision, and perfect cicatrization of the tarsal cartilage.

The above plan should have preference to any that interferes traumatically with the condition of the commissure, from the impossibility of its inducing abnormal contraction of the palpebral aperture or inversion of the lid (entropion)—accidents of no mean importance.

The operation of *reclination* has fallen into undeserved neglect, and, as a consequence, eyes are destroyed which would have had a good chance of vision if it had been selected for performance instead of extraction. A resort to it would be advisable where there is extensive fatty degeneration of the cornea and other tissues, and in subjects in whom the arteries have become seriously spoilt by atheroma, also in those who are affected with tertiary syphilis of old date. In the last two pathological conditions, intra-ocular hemorrhage is the complication to be dreaded after the removal of the lens, or even upon the mere evacuation of the aqueous humour (no hypothetical case); in the first, death of the corneal flap within eighteen hours of the performance of the extraction is not uncommon.—*Lancet*, July 31, 1875, p. 167.

70.—A NEW FORM OF ARTIFICIAL MEMBRANA TYMPANI. By GEORGE FIELD, Esq., Aural Surgeon to St. Mary's Hospital.

In treating cases of perforation of the membrana tympani, it has always appeared remarkable that some patients should derive benefit from Yearsley's pellet of moistened cotton-wool, while others gain greater advantage from Toynbee's artificial membrane. It has, therefore, occurred to me that the instrument I am about to describe might prove advantageous; and such I have found to be the case. It is simply a combination of Toynbee's artificial membrane, viz., a thin disc of india-rubber mounted on a fine silver-wire stem, and Yearsley's cotton-wool. In my instrument, the wire is carried beyond the india-rubber for about a quarter of an inch, and terminates in a second disc, made of flannel. The space between the two is filled up with a small portion of Dr. von Bruns's wound-dressing cotton-wool, which is absorbent, and so takes up and

communicates to the flannel disc any medicated solution which it may be desirable to apply. To prevent overcharging the cotton-wool, a pipette should be used, as one or two drops are sufficient to moisten every fibre of the wool and flannel.

Its advantages are the following:

1. It does not irritate the membrane, and being very soft, is not likely to injure it.
2. It is made of cotton-wool, which is absorbent; lotions can by this means be constantly applied with much advantage.
3. By thus keeping the part clean, the membrane gets into a healthy state, and the perforation heals.
4. The hearing distance is improved.
5. It is not liable to leave the india-rubber disc in the meatus.
6. It is easily used; and does not require the forceps, as is the case with Yearsley's cotton-wool.

The following cases are interesting.

E. F., aged 26, a clerk, came to consult me at St. Mary's Hospital, having suffered from deafness for twenty years. Both membranes were perforated. On the right side, there was a large perforation; he could not hear my watch on contact. On the left side, there was a smaller perforation; he heard the watch at the distance of an inch. On the right side, Toynbee's membrane increased his hearing about seven inches; cotton-wool had no effect. In the left ear, Yearsley's mode of applying cotton-wool answered best; the india-rubber disc having very little effect on this side. With my instrument, he can hear nearly eighteen inches on both sides. His hearing is thus greatly improved. The membranes are gradually getting into a healthy state. He says "he can now hear sermons," a benefit he was never able previously to enjoy.

H. J., aged 19, came to consult me at St. Mary's Hospital. She had been deaf for two years in both ears. The deafness came on after measles. She had a large perforation of the membrana tympani on the right side, with constant offensive discharge. She could not hear a watch on contact. After the new artificial membrana tympani was used, her hearing improved one foot, and by using (by this means) various lotions applied directly to the perforation, the discharge has gradually ceased, and her hearing distance when wearing the instrument is now one yard, and about four inches without it. The membrane now looks healthy, and the perforation is decidedly smaller.

W. D., had perforation of the left membrana tympani. He could not hear a watch on contact. He had been deaf eight months; the deafness came on after "brain-fever." This boy's hearing improved four inches, and the discharge, which had previously been very great, has ceased altogether.

H. L., aged 17, had had deafness for five years in both ears after scarlet fever. There were large perforations in both membranes. With Toynbee's artificial membrane, her hearing is greatly improved, four to five inches. The application of the cotton-wool also affords benefit; but, with the combination of the two, a much better result is obtained; for, when she wears them in her ears, she can hear ordinary conversation perfectly well, and the hearing distances were twelve and fifteen inches. The lotion she has lately used (which has quite stopped the discharge) consists of two grains of the nitrate of silver to the ounce of water; she says, also, that when wearing them, the sound seems much clearer than with the others.

S. M., aged 26, had perforation of both membranes, much the same as the last case. It came on from scarlet fever. Her hearing is improved to a very great extent on both sides. She says that my instrument is much more comfortable than the other, and does not move about like the india-rubber one; she also hears double the distance with it. The discharge has stopped.

I have several other cases of the same kind, both in hospital and private practice, in all of which the benefit has been the same.

My predecessor at St. Mary's, Dr. Peter Allen, was of opinion that in Yearsley's contrivance (when the natural membrane is perforated or lost) the benefit is derived from support given to the ossicula, by which they are enabled to exercise that due pressure at the fenestra ovalis, which keeps the membrane of the fenestra rotunda in a condition susceptible of vibration, and capable of transmitting them to the nerve-expansion of the labyrinth. And Yearsley himself says his object is to support the remaining portion of the membrana tympani or the ossicula, and that care must be taken that the entire opening be not covered, otherwise the experiment will not succeed; it is also indispensable to success, that the moisture of the wool should be preserved.

Toynbee, on the other hand, says, "It seems to me no doubt but that one of the functions of the membrana tympani is to confine the sonorous undulations to the tympanic cavity, in order that they may be concentrated on the membrana fenestræ rotundæ. Indeed, it is probable, that the vibrations only partially pass through the chain of bones to the vestibule, and that the air in the tympanic cavity is one great medium of communication with the labyrinth. If the means of communication with the labyrinth be the air in the tympanic cavity, it is palpable that any aperture in the membrana tympani is likely to diminish the power of hearing, by permitting the vibrations to escape from that cavity into the meatus, and so prevent their concentration upon the membrana fenestræ rotundæ."

But, in the supplement of his book, Hinton says, "Mr. Toynbee, also, modified the view he at first entertained. This he was partly led to do by intercourse with Dr. Julius Erhard who, without any perforation, found his hearing much improved by the use of cotton-wool, and published his experience in a paper entitled, *Deafness Curable by Pressure.*"

Roosa says, "That the artificial membrane is only of service in cases of partial or complete loss of the drumhead."

Von Troeltsch is of opinion, that the action upon which the benefit mainly depends is the pressure on the remaining portion of the membrana tympani and the chain of ossicula; whether it be that, by this mechanical influence a morbid relaxation in the connection of the ossicula is removed, or the fluid in the labyrinth is put under increased pressure. Such an India-rubber disc will act as a vibrating plate, and can transmit a considerable number of vibrations to one of the ossicula. (Politzer.)

This appears to me to be the best explanation. I use the cotton-wool for the necessary pressure on the remaining portion of the membrana tympani, and, at the same time, the India-rubber disc as a vibrating plate.

The improvement I suggest I have found of great service in nearly all cases of perforation. The instrument should not be worn at first for more than an hour at a time, the cotton-wool should be often changed, and the lotions altered occasionally; and, lastly, it is very essential that only a very small quantity of fluid should be applied to the cotton-wool.—*British Medical Journal*, June 19, 1875, p. 806.

SYPHILITIC DISEASES.

71.—ON INHERITED SYPHILIS.

From a Review by the EDITOR of the BRITISH and FOREIGN MEDICO-CHIRURGICAL REVIEW.

[By inherited syphilis is meant the disease which is originated from contamination of the ovum in utero.]

As, in doubtful cases, the diagnosis of inherited syphilis is greatly aided by the condition and history of the parents, it is very necessary to bear in mind the several sources and methods of infection. These we briefly state.

1st. It may be derived from the father, who, being the subject of syphilis, conveys the disease to the ovum by means of the semen. 2nd. From the mother, by means of the placental circulation, whereby the infected blood is conveyed from the mother into the system of the foetus. 3rd. Both parents may

be syphilitic, and therefore both the above-named modes of infection take effect. And it may here be remarked that the reverse of the second method of infection may take place, that is to say, a healthy mother may, by means of the placental circulation, be infected by a syphilitic foetus, which derives the disease from the vitiated semen of the father—an occurrence which explains the cases in which a woman who has never had primary syphilis, may exhibit secondary symptoms after nourishing an infected embryo.

The malignity of the disease is in proportion to the intensity of the infection, and this is affected by two causes : first, the mode of derivation ; secondly, the period of the disease in the progenitor. As to the mode of derivation, that is, whether from father, mother, or both parents, the rule is that the infection is most intense if both parents are diseased ; that disease of the mother alone is the next most potent cause ; and of the father alone the least. And as to the period of the disease in the progenitor, it is well established that the more remote the time of impregnation from the period when the parent first contracted the disease, the less profound will be the infection of the children. This is the case even independently of treatment. Thus a common history is such as the following. A woman the subject of syphilis had three children born dead ; at the fourth conception a living child was born, but so powerfully infected that it soon died ; the fifth child was less diseased and by care and treatment was reared. Should there be other children they may each be less infected until the latest may only present one or two symptoms, which in the absence of the history, would hardly be recognised as syphilitic. In the majority of cases the symptoms of inherited syphilis do not appear until a few weeks after birth, although the child often seems feeble and the skin of an unhealthy hue : there is no doubt, however, that a child may be born with symptoms of the disease. The greater number appear healthy at birth, and first shows symptoms of infection about a month afterwards. As Trousseau remarks, it is unusual for the symptoms to occur before the second week, or, *for the first time*, after the eighth month. But it is important to remember that a child who has been in apparent health for months, or even years, may suddenly show symptoms of inherited syphilis, it may be thought for the first time. We have lately seen a girl of 14 years in whom this occurred. But on investigation it will almost always be discovered, as in the case alluded to, that the child had some manifestations of the disease soon after birth, to which perhaps but little importance was attached, or which soon subsided under treatment, and which having lain latent for a long time, were only again educed by some depressing influence, such as one of the acute specific diseases of childhood, bad hygienic condition, or the like.

It is not necessary to enter upon a description of the ordinary symptoms of inherited syphilis, which are sufficiently well known; but there are a few of these which we think are of greater value than the text-books would lead one to suppose. For instance, there is none more striking than the physiognomy of the infant. The physiognomy of disease generally is a subject well worth study; every one must recall instances in which he has diagnosed from the face alone, cases of peritonitis, phthisis, chorea, and other affections; and in no disease is the facies more characteristic than in inherited syphilis. Trousseau has given of this, as of so many other diseases, a most graphic description. He describes the complexion as of a bistre tint; and there is a striking look of premature old age about these infants; the skin too is shrivelled, the body emaciated, and often there is a peculiar smell about the patient, for which we know of no better comparison than that of a damp vault.

One of the earliest and most constant symptoms is what is known among the poor as "the snuffles," that is, a thick discharge from the nasal mucous membrane, which blocks up the nares and causes a snuffling with the respiration, and a great, and sometimes serious obstacle to sucking. It also produces an alteration in the voice, so that the infant's cry has a peculiarly high-pitched or twangy sound. Then there are very constantly sores about the nates, flat mucous tubercles, or round copper-coloured, rather shining spots having a tendency to desquamation. Mucous tubercles occur also about the organs of generation, the mouth, the genito-crural fold, the axilla, between the fingers and toes, between the chin and lower lip; in fact, as Diday has remarked (giving the true explanation of their character) in any part where the skin is "thin, moist, and exposed to friction." The same kind of eruption takes place on the mucous membranes, and if the mouth is examined, there are frequently found white patches or ulcerations of a round or crescentic form, scattered about its lining membrane. A favourite position for these is the point of reflexion of the mucous membrane of the lips on to the gums, and the frænum of the upper lip; another is the border of the isthmus of the fauces. The extension of this eruption to the larynx gives rise, according to Diday, to another symptom frequently met with, namely, hoarseness, not the high-pitched note associated with snuffles, but a true hoarseness, very unlike the usual note of an infant's cry. Diday says this depends upon the eruption specially affecting the edges of the aryteno-epiglottidean folds.

Of the other eruptions the most common is a roseola, and this has less of the coppery hue than the other syphilides of infants. It chiefly affects the chest, neck, and inner part of the thighs, is an early symptom, and is distinguished from the other exan-

themata, such as scarlatina, but not being accompanied with febrile disturbance, by its imperfect disappearance on pressure, and "by its maintaining the same colour and degree until its termination." On the palms of the hands and soles of the feet there is commonly desquamation, giving an appearance of psoriasis. This is very characteristic of inherited syphilis. Besides this there is a kind of intertrigo seen very often, which differs from the ordinary intertrigo in its surface having a less bright red colour, but a much more shining or polished appearance, accompanied by a tendency here and there to slight desquamation. Eczema and impetigo are also not unfrequent symptoms, and are each of them of a darker tint and less acute character than when unassociated with syphilis. There has been much discussion as to whether or not the pemphigus of new-born infants is a syphilitic eruption. We are hardly able to assert that it is invariably of syphilitic origin, but certainly the subjects of it usually present other symptoms of inherited syphilis. Such a case as that related by Dr. Bulkley, in which the eruption continued to develop for nearly a year, and the child died of syphilis, is very strong evidence of its syphilitic character.

Another very common symptom is the existence of fissures or cracks at the edges of the lips and nares and the angles of the mouth, the scars of which are often valuable evidence of former mischief. The hair often falls off; so do the eyelashes, leaving a sore edge to the lids.

[The visceral lesions of inherited syphilis differ altogether from those of the acquired disease of adult life. They occur very early in the disease and are of the suppurative type, and progress very rapidly. Deafness, ulcerations of the pharynx and tongue, laryngitis and lupus are among the less common of the later manifestations of the disease.]

There has of late manifested itself in the profession a growing scepticism of the powers of medicines; a reaction, as we think, such as we see in so many other matters, from the unreasoning and sometime unreasonable belief in their virtues which preceded it: but none the more founded upon intelligent observation and deduction. But we think no one who has watched the effects of mercury given in cases of inherited syphilis ought to doubt the potency of at least that drug. We know few things in therapeutics more satisfactory than to witness the improvement of children thus treated; they rapidly fatten, lose their shrunk aspect, and change from little old men, to actual infants; the eruptions fade, the sores heal, and the progress is often astonishing. We do not of course assert that

this is the case in all; there are many children so profoundly affected by the disease that they die before remedies have time to act; or they may be born with fatal lesions already developed. But we cannot doubt that we possess great power over this disease, a fact which alone must always give an interest to its study, and an importance to its recognition.—*British and Foreign Medico-Chirurgical Review*, July 1875, p. 23.

72.—ON SYPHILIS, AND ON SOME LOCAL DISEASES AFFECTING PRINCIPALLY THE ORGANS OF GENERATION.

By HENRY LEE, Esq., Professor of Surgery and Pathology to the Royal College of Surgeons.

[Where the life of the blood is interfered with, the nutrition of every part of the body is affected. In the following lecture the morbid processes by means of which it is so influenced are considered.]

The results produced in the human body by the syphilitic poison are so various, affect a patient's constitution at such different periods, and are apparently so dissimilar in different cases, that it is necessary in studying this disease to distinguish accurately if possible between the essential actions which belong to the disease itself, and the various complications which may arise from lapse of time, from weakness of constitution, from the differences in the manifestations in its earlier and later stages, and especially from effects of accidental complications, or from the modifications produced by its recurrence.

Hunter prefaces his treatise on the venereal disease by the description of four morbid processes or actions, to which he constantly refers in his subsequent remarks. Since his day the nomenclature of these actions has been much varied and altered; but, as conveying any distinct and definite ideas, I do not think that it has been improved. These actions he calls the adhesive inflammation, the suppurative inflammation, ulceration, and mortification.

But in order to make his description of these processes available for our present purpose we must also consider how these actions are modified by the structures in which they occur.

An animal body, Hunter observes, is composed of a variety of substances, and we have an opportunity of observing the comparative progress of disease in them, and their comparative powers of restoration, and we find that they differ very much from each other in those respects. The healthy and morbid processes in growth, decay, and repair are, however, regulated by the same living principles, or, if we please, guided by the

same hand, in all living beings and in all diseases. In diseases arising from accident, a great difference in the degree of action takes place, according to the nature of the parts implicated: thus bone, tendon, ligament, and cellular membrane go through their morbid actions more slowly than muscle or skin. This principle is also abundantly illustrated in the different morbid processes produced by venereal diseases.

The same kind of action which produces an effusion of lymph upon the iris may, if it attacks the skin, be followed by a variety of modifications in the growth and development of the cutis or its coverings. If the cellular membrane be affected, an indolent tumour may result, which goes comparatively slowly through its stages, and may terminate in mortification, or perish by a still slower process of molecular necrosis. In the bones the same disease produces an increased development of bone, ulceration, or necrosis. In the lymphatic glands an enlargement is produced, confined strictly to those glands themselves, and not involving—at least, in the first instance, in any degree—the surrounding structures.

In internal organs the same disease may produce deposits, such as are illustrated in this preparation of syphilitic disease of the lung, and in this of syphilitic deposit in the liver. These deposits may be more or less perfectly absorbed, or more or less perfectly transformed, in the processes of nutrition and growth into tissue, resembling that of the organ in which they occur.

Case 12.—A gentleman has a secondary syphilitic eruption and symptoms of disease of the lung. For the latter disease he consulted a number of medical men, and was for a long time under treatment. The symptoms, however, persisted. As he wished to go abroad, I was requested by Dr. Tuke to see him for his secondary symptoms before he went, and he was accordingly placed under treatment, which he had not time fully to carry out, but the eruption almost entirely disappeared, and with it all his lung symptoms. These had not returned two years afterwards.

Case 13.—A patient in the Lock Hospital, many years ago, was pronounced by the physicians of the hospital to have one lung in great part consolidated. I did not know at the time what the disease might be, but I thought I would, at all events, treat his secondary symptoms. These disappeared, and with them the lung affection, and he was seen some months afterwards in apparently perfect health, following his occupation as an omnibus conductor.

The most important modification of increased action, as far as our present subject is concerned, is that which is observed in mucous membranes as compared with other structures in the body.

Hunter showed that a mucous membrane under violent irritation would, like a serous membrane, produce lymph; but, generally speaking, inflammation of a mucous membrane terminates either in resolution, an increased secretion of mucus, or in suppuration. But although the secretion from the surface of a mucous membrane differs in general from that of a serous membrane, yet the membranes themselves may be affected in a similar way. Effusion of new material may take place in their structures, and in the cellular tissue in contact with them. They may both become infiltrated, thickened, and permanently altered. With regard to the serous membranes, we often see an example of this, as in the case of old omental herniæ; and with regard to the mucous membranes, most interesting examples are afforded, in illustration of our present subject, in the formation of mucous tubercles, and in the more or less permanent thickening of the mucous membrane of the urethra. These will hereafter occupy our attention particularly. I will only at present note that the mucous membrane of the urethra may be thickened by the syphilitic poison, as shown by cases similar to the following, which in practice are not very uncommon.

Case 14.—A young gentleman contracted syphilis, followed by secondary symptoms. He had never had gonorrhœa. In the course of the manifestation of the secondary affection the stream of water gradually diminished. He had apparently an ordinary stricture, which was cured by the specific treatment, without the use of instruments. There was no urethral discharge in this case.

When the venereal poison, Hunter observes, is applied to the skin, its effects are generally manifested first in a pimple, which is commonly allowed to scab. The scab is generally pushed off or rubbed off, and one larger than the first forms. Hunter defines this process of scabbing as the first mode of healing a wound or sore in which inflammation may be greater than where union can be effected, but not nearly so great as where suppuration takes place. We shall, I think, understand Hunter's idea in this respect by considering what he says with regard to the constitutional forms of the disease. "When the poison has got into the blood it there irritates to action. There are produced from that irritation many *local* diseases, as blotches on the skin or thickening of the periosteum and bones." These forms of disease he calls compound or constitutional; yet he says they are not strictly so, for every complaint, in consequence of the malady, is truly local, and is produced by the simple application of the poison to the parts. Now if this be true, as I believe under given conditions I shall demonstrate it to be, the distinction between what we have been in the habit

of calling primary and secondary syphilitic affections in a great measure disappears ; and in truth, in uncomplicated cases and in a healthy constitution, where there is no accidental cause of irritation, the local and the constitutional manifestations very much resemble each other, and are in fact of the same nature. One of the first cases of syphilis which I recollect affords an illustration of this.

Case 15.—A boy, scarcely arrived at puberty, had a small, circular, slightly elevated induration on the skin of the penis. This soon became covered by a thin scale. In due course a scaly eruption appeared on the body, and the appearances of these very accurately resembled the primary affection. The disease ran its course without ulceration or suppuration of any part.

Case 16.—A gentleman had a small crack on the middle of the lower part of the prepuce, which had often caused him some annoyance. On one occasion, after a suspicious intercourse, the edges of the crack became indurated. The induration was to a very limited extent, perfectly circumscribed, and was accompanied by enlarged glands in the groin. He could hardly believe that it was of any consequence. It was, however, followed by a specific eruption, which continued, on and off, for about three years ; but none of the secondary manifestations ulcerated or suppurated.

Case 17.—A gentleman had a very slight induration on the skin on the right side of the penis. It was quite unattended by any irritation or ulceration, and so slight that I doubted at first as to its nature. It however persisted, was accompanied by slightly enlarged glands in the groin, and remained accurately circumscribed. I then told him my opinion. He, however, did not think it could be syphilitic, so trifling was it in appearance. In due time, however, a scaly eruption appeared on the body, and continued on and off slightly for several years. This patient had never had gonorrhœa, but as the successive secondary manifestations of syphilis developed themselves he had occasionally a thin discharge from the urethra, unaccompanied by any ardor urinæ. It had the appearance of thin gruel, and left a stain upon the linen. I have no doubt but that it arose from a secondary inflammation of the mucous membrane of the urethra. Now these, and many more which I could mention, afford illustrations of adhesive inflammation only. In both the primary and the secondary affections an attempt was made to heal by scabbing, but in this disease the attempt does not succeed, and successive scabs or scales are formed. These are all modifications of the adhesive inflammation, which would terminate in resolution if its cause were not persistent. Many drawings of my own and of others

demonstrate the fact that what we call the primary disease may go through its stages without any suppuration and without ulceration ; and here I would observe that it is a characteristic of both the primary and secondary affections of this disease that in uncomplicated cases they leave no scars on the body. They are attended with no loss of substance, and, as we shall hereafter see, the artificial inoculations from these affections follow the same rule. It is quite true that it comparatively seldom happens that the syphilitic poison runs its course without some accidental causes of irritation. This may depend upon some other irritating fluid being applied at the time of inoculation, upon want of power in the patient's system, or upon the changes which occur in the original products of the adhesive inflammation. The true characters of this inflammation in primary syphilis are given by Hunter with comprehensive clearness and brevity. The process results in a peculiar thickening, very circumscribed, not diffusing itself gradually and imperceptibly into the surrounding parts, but terminating rather abruptly. This description is perfectly true, whether the induration be scarcely thicker than a layer of cuticle, or whether it involve the whole thickness of the skin. It retains these characters through all its stages, though they may be obscured by accidental circumstances. The secondary affections also maintain this circumscribed character, but are unattended with the peculiar defined induration, for a reason which will hereafter be more fully considered. This induration, according to the Hunterian doctrine, depends upon the effusion of lymph, the product of adhesive inflammation. If the lymph were produced from a non-specific cause, it would be organised and converted into a tissue similar to that of the surrounding part, and ultimately anything that was redundant would be absorbed. But the life of this lymph is touched with the same disease as the blood, or the products of the blood from which it is derived. It has a vitiated existence, and tends soon to pass, except in very vigorous constitutions, into a state of degeneration. This may manifest itself in various ways: (1) by an unhealthy formation of epithelium, producing various kinds of scabs and scales; (2) by unhealthy growth of the hair, nails, or teeth; (3) or by the effusive matter itself undergoing a kind of molecular necrosis, suppuration, or ulceration. These latter processes, although they may occur in all stages of the disease, are most marked when the poison is first received, because then acting on a virgin constitution. Accordingly, we find that the adhesive inflammation first produced, in the majority of cases passes from the adhesive stage to some other form. The product is no longer fit for the life of the part, and is thrown off in one of the forms above-mentioned. A double action then goes on,

one of adhesive inflammation, accompanied by induration, another of throwing off of diseased cuticle, or suppuration or death of the newly-formed tissue.

These two consequences, the induration and destruction of the newly-formed tissue, as Babbington has observed, seem to be distinct and independent actions, since, although they generally exist in conjunction, they are sometimes found separate, one or the other of them being in some cases wanting. These two processes may sometimes be witnessed in the same case at different times under the influence of treatment. A patient may have a well-marked primary induration, and under the action of mercury the induration will disappear, and a soft sore will only for a time present itself, but after an interval the induration will reappear with its specific characters.

Now, all the cases which I have given in the previous and in the present lectures are instances in which the poison of syphilis produced at first the adhesive action only, by means of which the nutrition of parts was more or less perverted, both in the primary and secondary manifestations of the disease. Coinciding with and confirming these practical observations are the results of direct experiment.

Case 18.—A patient, under the care of M. Puche, in the Hôpital du Midi, was inoculated on the abdomen on the 29th of January, 1861. The inoculated matter was taken from an indurated chancre, which had existed six weeks, and which was followed by secondary symptoms. On the 19th of February, as no result had appeared, the patient was inoculated from another indurated chancre. On the 8th of March, thirty-nine days after the first inoculation and seventeen days after the second, two little pimples appeared on the inoculated spots. The first became excoriated after the lapse of some days, but the second presented on its summit a small point of suppuration. Both presented the specific induration of primary chancres. On the 10th of April this patient had a general eruption of roseola.

Case 19.—Rinecker records the following;—On the 13th February, 1852, an inoculation was made on Dr. Warnery. This was effected by means of a blister. The blistered surface soon healed. On the 9th of March, however, it became inflamed. Infiltration had taken place in the skin, which was hard and thickened. On the 21st of March, thirty-five days after the inoculation, and thirteen after the appearance of the specific primary symptoms, the blistered surface was covered by a mass of tubercular excrescences. These were copper-coloured, raised above the surface, and in some places confluent. They were covered for the most part with brown crust, slightly adherent, or with thin grey scales. Eleven weeks after the

inoculation he had severe pain in the head, followed by a syphilitic eruption on the head and face. This was succeeded by inflammation of the soft palate and neighbouring parts, with a superficial exudation of lymph. Ultimately mucous tubercles appeared on the scrotum, the perineum, and on the inside of the thighs.

Case 20. (Related by Baerensprung.)—M. C. had never had syphilis. She was inoculated on the right thigh from an indurated chancre in three places. The inoculation was made on the 28th of May, 1859. On the 1st of June the inoculated spots appeared as little red points, without any surrounding inflammation. On the 6th of June it was impossible to distinguish them. On the 25th, however, three little red tubercles appeared on the inoculated parts. On the 5th of July the corresponding glands in the groin were enlarged. The tubercles were also considerably increased in size, and ulcerated on their surface. On the 12th, two of the tubercles had united, and presented a raised, accurately defined induration. The inguinal glands were very hard, and not painful. On the 20th this ulceration was the size of a franc piece, with a base almost as hard as cartilage. There was no suppuration, but the surface was covered by an adhesive secretion. On the 29th there was an eruption of roseola and mucous tubercles.

Case 21. (Recorded by Lindwurm.)—M. had never, as far as could be ascertained, had syphilis. She was inoculated with the secretion of two indurated chancres of a patient who at the same time had secondary symptoms. No immediate results followed. Fifteen days after the inoculated points reappeared as two little red stains, which insensibly became transformed into little reddish-brown tubercles. On the 28th there was superficial erosion of these little tubercles, followed by excoriations covered by thin brown crusts. On July 8th these so-called ulcerations had increased and were surrounded by slight induration. The corresponding inguinal glands now became enlarged, and subsequently the glands in the opposite groin. A papular eruption followed, especially upon the organs of generation.

Case 22. (Also recorded by Lindwurm.)—A young woman was inoculated with the secretions of the chancres of the previous case on the 10th of July, and again on the 12th. Some small pustules followed these inoculations, and became covered by small scabs. The whole of these inoculations were healed in seven days—namely, on the 17th of July. On the 29th of July, however, although all traces of the inoculations had previously disappeared, five red tubercles, corresponding with the inoculated points, showed themselves. These tubercles became covered by thin crusts, and converted into indurated chancres.

In the middle of September the manifestations of constitutional syphilis were developed.

Case 23. (Recorded by M. Rollet.)—A patient was inoculated from an indurated chancre. Eighteen days afterwards a papule was developed, which became ulcerated on its surface. This, as M. Rollet believes, was prevented from being developed into a regular indurated chancre by antisymphilitic treatment.

The examples of artificial inoculation hitherto given are cases in which the inoculated matter was taken from primary syphilitic sores. The following are instances in which the inoculated secretion was taken from some secondary affections.

Case 24. (Reported by Gibert.)—A patient, affected with lupus of the face, was inoculated on the left arm, by means of a blister, with the secretion of mucous papules from the anus of another syphilitic patient. Five days afterwards there was no trace of the effects of the inoculation, and at the expiration of nine days a little redness only was left on the blistered surface. On the eighteenth day of the inoculation a raised copper-coloured papule appeared on the inoculated spot. On the twenty-second day a little exudation appeared on the surface of the papule, which was enlarged. On the twenty-ninth day there was an enlarged gland in the corresponding axilla. On the thirty-second day a crust was detached from the surface of the papule, which was superficially excoriated. On the fifty-fifth day the papule had become converted into a tubercle, which was superficially raised and indurated. Some red spots now appeared on the body. These soon showed themselves also on the anterior surface of the arms, the inside of the thighs, and the inguinal regions.

In another instance (*Case 25*) mentioned by Gibert, the period of incubation between the inoculation and the appearance of the first local symptoms was twenty-five days. A little redness then appeared, followed first by a dry papule, which subsequently became moist and excoriated. It then became covered by a crust and indurated, and ultimately became a tubercle, which ulcerated on its surface, as in the preceding case. A corresponding lymphatic gland became enlarged, and thirty-seven days after the inoculation a rash of roseola manifested itself on the patient's body.

Case 26. (Reported by Lindwurm.)—A patient affected with lupus had a small blister applied to the neck. On the blistered surface a small piece of the mucous membrane of a syphilitic tubercle on the lip was applied. The wound in the neck appeared to heal in five days, but three weeks later the wound again inflamed, and an ulcerated papule appeared. This was followed by enlargement of the cervical glands and copper-coloured blotches.

Case 27. (Reported by Wallace.)—A young man was inoculated in three places on each thigh from the syphilitic pustules of another patient. In this case the punctures were first made, and the secretions of the pustules applied to them. The punctured spots did not inflame. Thirty days afterwards the patient complained of heat on the inoculated spots. Two of the spots on the left thigh, and all three on the right, presented little raised pimples of a reddish-brown colour, with faint scales on their surface. One of these scales became a scab, and when raised exposed a superficial ulceration. The corresponding inguinal glands were enlarged. The pimples soon became converted into ulcerated tubercles, which were round, slightly depressed in the centre, and of a dirty white colour, like condylomata. A scaly eruption on the body followed.

Case 28. (Reported by Vidal.)—M. Boudeville was inoculated on the 1st of November with the secretion of a pustule from a syphilitic patient. A papule appeared on the 3rd; this became covered by a crust, under which some pus formed. This continued until the 15th, when the local inflammation subsided. Thirty-five days afterwards, however, a fresh action commenced. Two fresh pustules made their appearance at the inoculated points, and were very long in healing. Flat lenticular pustules on the head, loss of hair, enlargement of the cervical glands, sore-throat, mucous tubercles, and an eruption of roseola followed.

Case 29. (Reported by Rinicker.)—On the 9th of January, 1852, a young physician was inoculated on a small blistered surface with the secretion of a syphilitic eruption of a child. On the 10th no visible effects had followed the inoculation. On the 20th there was a papular eruption around the inoculated spot. This soon disappeared. On the 2nd of February a fresh action commenced. The surface which had been blistered was red, itching, and scaly. Twenty-nine days after the inoculation this surface was of a deep red-copper colour, the skin was hard and infiltrated, and presented several papular elevations. On the 10th of February the whole surface which had been blistered was covered with reddish-brown, hard tubercles, covered with scales. In spite of the use of mercurial ointment, these local affections were followed by ulceration of the palate, of the lower lip, and of the left side of the frænum of the tongue, and later by mucous tubercles on the scrotum.

Case 30. (Reported by Waller.)—A boy of twelve years of age was inoculated with the matter from a syphilitic patient on the 6th of August, 1850. The matter was placed by means of a small piece of wood and lint on wounds made by a scarificator. At the end of four days the wounds made by the scarificator had healed. On the 15th of August there were

some red spots on the inoculated parts, and on the 30th fourteen tubercles presented themselves in the same situation. These were of a dirty red colour, hard to the touch, and almost exactly circular. Some of them presented a slight desquamation. The following days the tubercles increased in size, and all became confluent. When the crust was removed, the tubercles appeared slightly excoriated, raised, and flat. They soon again became covered by fresh thin scales, which were of a grey colour and dry. Twenty-seven days after the appearance of these tubercles, and fifty days after the inoculation, a syphilitic eruption appeared, which soon covered the whole body.—*Lancet*, July 24, p. 121.

73.—ON THE TREATMENT OF SYPHILIS.

By HENRY LEE, Esq., Professor of Surgery and Pathology
to the Royal College of Surgeons.

Sir B. Brodie, following Mr. Pearson, gives the decided preference to the inunction of the mercurial ointment to all other plans of treatment in use in his time. He says:—

“When the symptoms are not of a mild character, the patient should, if possible, be confined to the house, except for an hour or two in a fine day. The going out into the fresh air (as Mr. Pearson observed long ago) will counteract the influence of mercury. You never can be responsible for thoroughly eradicating the disease where the patient is at all exposed to cold or wet, nor where he does not lead a perhaps regular and careful life in all respects.

“In all cases of syphilis in which you employ mercury, remember that you have two objects in view: the first, to cure the present symptoms; the second, to prevent a return of the disease. It seems to me that a great number of practitioners at the present day regard only the first object, and lose sight of the second. I have frequently seen a person who has taken mercury for a chancre, which has, perhaps, healed in a fortnight, and then has left it off, although a very hard cicatrix has been left. Under such circumstances, in nineteen cases out of twenty, there will be secondary symptoms. If mercury be taken for the primary symptoms, the patient should never leave it off till the hard cicatrix has disappeared, nor indeed for some time afterwards; and so, where it is given for secondary symptoms, it should be continued for a considerable time after they have disappeared. A man has an eruption of the body; it fades away, under the use of mercury, in the course of a month; but the remedy must be used as a prophylactic for another month. If a patient be confined to his house, or only allowed

to go out a little on a fine day; if he be made properly to rub in the ointment, and the course be carefully watched and continued for some time after the symptoms have subsided, you will, I am satisfied, in the great majority of cases, make a real and permanent cure of the disease. I suspect that this is not the way in which it is administered by the majority of practitioners at the present time, but it was so administered formerly. You must not suppose that we have advanced alike in all departments of surgery; indeed, I am sure that in some things we have gone back, and I believe this to be one of them. I am much mistaken if the mercurial treatment of syphilis, as employed by the late Mr. Pearson during the greater part of his life, was not as nearly perfect as possible. At any rate, it was much more successful than the less careful treatment of modern practitioners. That gentleman was surgeon to the Lock Hospital; and having no general hospital to attend to, the powers of his mind were more especially devoted to the study of syphilitic diseases and their treatment; and the practice which I have now recommended was that which he usually adopted. When I was young in my profession I had frequent opportunities of meeting him in private practice, and of learning how profound a knowledge of the subject he possessed; and I may take this opportunity of recommending for your perusal his treatise on the various articles of the *materia medica* recommended for the cure of syphilis, in which he offers many excellent observations on the use of mercury, and enters into details in a way in which it is not my object to enter into them at present."

The preparations of mercury generally used were the blue pill, the mercurial ointment, calomel, corrosive sublimate, and the iodides and bromides of mercury; for fumigation, the grey oxide and the bisulphuret.

On account of its convenience, and the little trouble it gives, the administration of mercury in the form of pills is that which the patient prefers. But mercury can seldom, if ever, be given in this way long enough to cure the disease. It acts upon the patient's stomach and intestines before it has accomplished its object, and it then has to be discontinued. It may for a time, however, be usefully employed either by itself or in combination with external treatment. Three grains of blue pill, with half a grain of opium, night and morning, or half a grain or a grain of the iodide of mercury, with a quarter of a grain of opium, night and morning, are convenient modes of giving mercury internally, and will in general soon produce its specific action. The corrosive sublimate or perchloride of mercury can never be trusted to for the cure of syphilis, although it is a valuable auxiliary in some stages of the disease.

The inunction of the mercurial ointment is the plan of treatment recommended by Mr. Pearson and Sir B. Brodie. This answers very well if a patient will carry it out, but it is not often in private practice that this can be accomplished. It involves a considerable amount of trouble, and the patients object to the dirty appearance on their skin and on their clothes. This last objection has of late been partially removed by the introduction of the oleate of mercury. In some patients the skin does not bear the inunction of mercury well. A crop of pustules not unfrequently appears, and this sometimes gives the patient a considerable amount of annoyance. Mr. Pearson was in the habit of commencing by the inunction of half a drachm of strong mercurial ointment every night, and he was very particular during the treatment not to allow the patients to be exposed to the influence of cold air. He kept them to their room, and sometimes to their bed. The advantage of this plan he found to be that the stomach and bowels did not often suffer from the action of mercury as a metallic salt; a larger quantity of mercury could be administered; the specific powers of mercury could be obtained with great certainty, and sometimes advantage might be derived from the friction being employed near the seat of the disease. The inconvenience of the pustular eruption he found might be avoided by previously shaving off the hairs. All acids during a mercurial course were forbidden, and even tea, if it became acid on the stomach. No vegetables except potatoes were to be eaten, and occasional aperients were administered, as it was found that a common effect of the plan of treatment was to induce constipation. Mr. Pearson was in the habit of increasing the quantity of mercury used to one or two drachms, or even half an ounce. The salutary or specific and injurious effects he thus sums up:—

1. It may prove fatal by acting as a metallic salt, in which case it produces vomiting, fainting, diarrhoea, and dysentery. Where such symptoms arise, even if unattended with danger to life, the treatment will fail in its specific operation.

2. It may act as a mineral poison, not by its direct action upon the stomach, but by producing erethismus, inflammation of the joints, effusion into the bursæ, ill-conditioned ulcers, mortification of parts, and great debility. In all these cases the mercury acts as a mineral poison, affecting very much the mind and the constitution in general, and not producing its beneficial effects on syphilis.

3. Mercury often acts beneficially by promoting perspiration.

4. It promotes the urinous secretion, frequently rendering it turbid and offensive, and liable to deposit a white sediment.

5. It often produces inflammation of the glandular surface of the mouth, swelling of the tongue, and sponginess of the gums.

6. It promotes increased secretion of saliva, producing ptyalism.

7. It sometimes induces powerful depression of the animal functions.

The increased secretion from the skin, kidneys, and salivary glands, with depression of the animal spirits, were considered consistent with its operation as an antidote.

Mr. Pearson was of opinion that the gums should always be made tender and spongy, but this was only to be considered as an evidence of the action of the remedy, and as constituting no essential part of the process of cure. The plan of treatment was continued, if possible, until the symptoms had disappeared, and for some time afterwards, and this might occupy from seven to nine weeks.

I have been particular in giving an account of the action of mercury in Mr. Pearson's day, as, under the milder treatment now pursued, some of these results are seldom seen and little known. But another evil has crept in—namely, that patients who have been supposed to have undergone a mercurial course have done so very inefficiently; the gums have perhaps been “touched,” the mercury has then been discontinued, and the disease has remained.—*Lancet*, Aug. 14, 1875, p. 237.

74.—ON SOFT CHANCRES IN THEIR RELATION TO SYPHILIS.

By JONATHAN HUTCHINSON, Esq., Senior Surgeon to the London Hospital.

Amongst the important practical questions which are connected with this subject we have chiefly—1st, At what period in the course of a chancre can the surgeon venture an opinion as to its nature? 2ndly, Are the characters of the two forms of chancre, soft and hard, often mixed? And 3rdly, Can a chancre which presented at one stage all the characters of a soft one subsequently become indurated? If I have made my meaning clear in what I have already said, you will be at no loss to find an answer to these questions. My position is that the soft sore results simply from pus-contagion, this pus being more or less peculiar, and its peculiarities being due to its having originated in syphilitic inflammation. I have insisted that this pus may or may not contain the germ-matter of syphilis. We are therefore much in the position of a farmer

who sows in his field two seeds mixed together of very different rates of germinating power—clover and barley, for instance. The one which grows quickest is the one which first attracts attention, and it may be that one conceals the other. So it is if the fluid which conveys syphilis be an admixture of contagious pus and the specific germs of the true disease. The pus will irritate directly; the syphilitic germs need their period of incubation. Thus you will have first an inflamed pus-secreting ulcer, entirely free from induration. This may go through its course and heal, and then, at the end of a month, when the syphilis-incubation period is past, you may find proof in the induration which comes on that another and wholly different kind of seed had been sown at the same time. It is much the same as with the farmer when he cuts down his barley and finds the clover growing at the bottom. I might carry this agricultural simile yet further, and might remind you that if the barley has been particularly heavy, if it has been laid and matted, it may kill the clover altogether. It is just so when a contagion of mixed material occurs in syphilis. If the soft sore is a very bad one—or perhaps I ought to use the reverse epithet—it may altogether destroy the germs of the other poison which were implanted with it. Probably in this way many a soft sore does really prevent the development of a hard one. In practice, however, this happy result is by no means universal, and it is a very common event to see a transitory soft sore followed by specific induration.

Let me here insist upon the extreme importance to the reputation of the practitioner of the rule never to give an opinion as to the nature of a chancre until the incubation period is over. Patients will come to you with sores contracted a few days or a week or two before, and will expect you to be able to tell them whether or not they are likely to have syphilis. Now, there is never anything in the conditions which are either present or absent which will justify the most practised observer in giving any opinion at such a stage. It is very rare indeed that an infecting sore acquires any induration within three weeks of the date of contagion, and more commonly it is a month or five weeks. Until such induration takes place, nobody can tell whether it is coming or not.

Very various indeed are the conditions which may have been present during the preceding period. Your patient may have had a soft sore, which may have been severely inflamed, or even phagedænic; he may have had a bubo, and that bubo may have suppurated; or he may have had no sore at all, and no bubo. Let your rule be, I repeat, to give to your patient no opinion whatever as to his chance

of escape until he can assure you that it is one month since his last exposure to risk. It is a matter of constant experience to be told by patients that the medical man first consulted assured them that the sore was only a soft one, and would not infect; and, under such circumstances, it is always very difficult to restore the patient's confidence in his adviser's knowledge. If the contagion of syphilis were always effected with the same care as to purity of the virus as is exercised in the case of selection of lymph for vaccination, it would not have been necessary to teach this doctrine of caution now. No one thinks of speaking as to the prospect of the success of vaccination during the first few days, nor would he be able to do so even so soon as that were it not that the vaccine vesicle is enabled to develop itself uncomplicated by other morbid processes. It is not so, however, with syphilis, and hence the variety of the results which we witness during the first two or three weeks after contagion. If the virus be introduced in a pure, or almost pure, state, then it is probable that in many cases the patient experiences nothing excepting, perhaps for a few days, a little red pimple, which disappears, and leaves him, as he thinks, quite well for another three weeks or a month. At the end of that time the part begins to itch a little, and again becomes red, and gradually within a week or so a well-characterised induration is developed. If, however, the contagion have been effected by a mixture of contagious pus and specific virus, then you have a very different course of things. Within the first few days the contaminated part may inflame sharply, and an ulcer may result which will probably send the patient in great alarm to his surgeon. This sore is, of course, soft; it secretes freely, and its secretion may contaminate other parts, and you may have what are termed multiple soft chancres. You may inoculate it, if wished, on the patient's skin, and produce other similar sores, and thus prove that you have to do with a non-specific secretion. But all this does not prove that the specific poison is not there, and whatever may be the course of these soft sores, whether easy to heal or obstinate, there remains the risk that the specific induration may ultimately be developed. Probably the worse the sore, the more the inflammation, and the deeper the ulceration, the greater is the patient's chance that the specific virus may be thrown off; whilst if the sore heals in a few days the danger of true syphilis is considerable. We often, from patients who are the subjects of tertiary disease, hear the statement that the original sore healed in a week, and gave scarcely any trouble. Such cases are, I suspect, examples of the early

healing of a conspicuous soft sore, which was followed some weeks later by an inconspicuous and unobserved hard one. Should the soft sore, however, be of protracted duration, it is, I suppose, possible that its characters may extend over the whole period of induration proper to the specific one. Under these circumstances the characters of the specific sore may be masked, and even good observers may never have been able to detect the characters of specificity in sores which yet proved infecting. At any rate, I am sure that you must be prepared to find that occasionally syphilis will follow from sores which you have had frequent opportunities of examining, and which from beginning to end you had thought to be soft and suppurative. If the sore should not only ulcerate, but become phagedænic, it is then usually quite impossible to diagnose induration; yet, under such circumstances, secondary symptoms often, or indeed usually, follow.

If the argument which I have used be correct, it follows that whenever you detect induration you will be certain that constitutional syphilis will follow, but that, however sure you may be of the absence of induration, you can entertain no security unless a long period has elapsed. You will ask, naturally, If this be so, would it not be well, bearing in mind the very serious consequences which syphilis entails, to deal with all soft chancres as if they were infecting ones? Candidly, my belief is that there would be great wisdom in adopting this rule, at any rate so far as local applications are concerned. In very many cases I have no doubt that the soft sore occurs exactly over the site of a coming induration; and should your patient consult you within a reasonable period of the exposure to contagion, I cannot but think that it is good practice to destroy it by deep and free cauterisation, rather than to attempt merely to make it heal. Some of the published records of attempts at abortive cauterisation of chancres prove that it is not possible in all cases to prevent the subsequent development of induration; but a few failures of this kind by no means make it certain that the practice would not be productive of good results in the long run. It might fail sometimes and succeed sometimes. It unfortunately happens that we should know when we failed, and should never know when we succeeded. It is very difficult, however, to believe that the progress of imbibition of the syphilitic virus is so rapid that there is no stage during which it exists only in the contaminated spot. How long this stage may be it is exceedingly difficult to tell, but for the present I cannot but think that it is wise to act as if it comprised the first

week or ten days after inoculation. I have been alluding hitherto only to treatment with the object of utterly destroying by cauterisation the portion of tissue in which the poison is suspected to lurk; but there remains the question as to how early we ought to attack the virus by its antidote. It is, I am glad to believe, becoming increasingly the rule of English practice to give mercury as soon as ever specific induration can be recognised; but it is quite possible that we may, in the future, go further than this, and think that it is best to prescribe this remedy for all sores occurring within a month of contagion. We should no longer do so under the impression which formerly prevailed, that it was necessary in order to make the sore heal, for we now know that the soft sore is not syphilis, and cannot be influenced by its specific. The reason for giving it would be the fear that the patient may be passing unnoticed through the incubation stage of a true chancre. The soft sore proves that he has been contaminated with venereal pus, and shows that it is not improbable that he may have received the syphilitic virus also. It is quite possible that the antidotal efficacy of mercury may be much greater in the early stage than in the later ones. I wish, however, to have it distinctly understood for the present that I am merely suggesting, and not recommending. I am often pressed by patients to allow them to take mercury on speculation for soft sores, but hitherto have for the most part declined to do it; my reason being, that until some proof has been afforded that we have to deal with true syphilis, we have no data by which to determine the requisite length of treatment.—*Lancet*, Sept. 25, 1875, p. 444.

MIDWIFERY, AND THE DISEASES OF WOMEN AND CHILDREN.

75.—ON THE EMPLOYMENT OF NITRIC ACID IN ULCERATIONS AND EROSIONS OF THE CERVIX UTERI.

By Dr. JAMES BRAITHWAITE,

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Cases of ulceration or erosion of the os uteri, with or without endo-cervicitis, are so common, and in hospital practice so numerous, that some more efficient and less troublesome caustic than nitrate of silver is urgently needed for their treatment. I have carefully and fully tried the action of most caustics (including carbolic acid), and found none to answer the purpose so well as nitric acid. The great fault of nitrate of silver is the fugitive nature of its action; its influence seldom extends beyond five or six days, even when rubbed upon and held in contact with the parts. It is more a stimulant than a caustic, as it produces no slough, and causes extreme turgescence of the capillaries immediately below the surface influenced, as evidenced by the occurrence of hemorrhage, often sufficient to obscure the parts before it has been removed from contact with them. At the second examination we often find the ulceration or erosion little if at all altered in appearance. This defect must be atoned for by the frequent reapplication of the remedy, necessitating each time the use of the speculum. I believe in this evil really lies the source of the opinion held by some eminent men, that these diseases require little or no local treatment, for our opinions are often unconsciously influenced by our wishes. Nitric acid, on the other hand, is a really efficient caustic, producing a slough, which is peculiarly firmly adherent, and which consequently necessitates a healthy effort by the subjacent parts for its separation. The only other caustic which produces a slough of the same character is nitrate of mercury. Nitric acid moreover requires no special preparation; it does not spread like potassa c. calce, nor is its action so deep; it produces little or no pain and no hemorrhage. These advantages are trivial compared with the fact, that when

once it has been properly applied, in many cases no further interference is necessary, and thus the frequent use of the speculum may be done away with. When the second examination is made, it should be after the lapse of a month, and it will then sometimes be found that there is a small spot requiring a fresh application of the acid, but often the sore appears to be quite healed or to be healing satisfactorily. The fresh mucous membrane which forms is not cicatricial in appearance, and when healing is going on satisfactorily, it has a sharply-defined edge, and being of a pale rose colour, contrasts strongly with the bright red of the sore. The contraction is greater than follows the use of any other caustic; but this is a great advantage, for on account of the relaxed state of the tissues, it is just what is required to insure the permanence of the cure.

The acid is best applied by means of a small and tightly rolled piece of cotton wool, which is to be placed by an ordinary speculum forceps in contact with successive portions of the surface until the whole is covered with a white eschar. In a case of chronic endo-cervicitis, the acid should be applied to the interior of the open cervical canal, and if it is not open the case is not one suitable for the treatment. The contraction which accompanies healing is only to a healthy and natural degree. Provided the caustic has been used with ordinary prudence, I have never seen anything but good follow its use, and the ease with which a chronic case of cervical catarrh, with ulceration or erosion, may be cured by it is something marvellous. The bulk of my cases have been hospital out-patients, and the comfort the use of nitric acid has been in their treatment is very great, both in certainty of result and in saving my own time. Without local treatment very little can be done for these patients, for hygienic treatment is generally impossible, and medicinal treatment alone is useless. I shall not take up your space by details of cases, although I have copious notes of about forty. By trial of the remedy a proper estimate of its value will soon be formed.

The use of nitric acid as a caustic is so familiar to us all, especially in the treatment of some diseases of the rectum, that I had some hesitation in bringing the subject before you, and should not have done so but that I believe it is only used by two or three medical men engaged in the treatment of diseases of women. It is mentioned incidentally at the conclusion of a paper by Dr. Lombe Atthill, upon its application to the interior of the uterine cavity, that he uses it habitually in the diseases in question; and Dr. Roe, of Dublin, in an analysis of 164 cases of uterine disease, relates a case of extensive ulceration in which he employed it. Mr. Robert Ellis has recommended the use of a saturated solution of nitrate of silver in nitric acid, and

I believe Dr. Bennett has mentioned it also; but these writers are exceptions to the general rule. It is not mentioned by Tilt in his admirable work on uterine therapeutics, nor by any other of our standard authors upon diseases of women, all of whom recommend nitrate of silver, or mention its use as the usual practice.—*Obstetrical Journal*, Nov. 1875, p. 504.

76.—A NOVEL TREATMENT OF OBSTINATE VOMITING IN PREGNANCY.

By Dr. EDWARD COPEMAN, Senior Physician to the Norfolk and Norwich Hospital, President of the British Medical Association.

[The following paper contains the account of three cases, which if further corroborated may open a wide field of usefulness in the treatment of a very obstinate, rebellious, and sometimes fatal form of sympathetic disorder.]

During a long professional life I have had much experience of this troublesome affection, and amongst medicines have found calumba and oxalate of cerium the most beneficial; but these and all other medicines often fail, and the treatment suggested by the following cases, discovered by accident as it were, and never, as far as I know (although nothing is new under the sun), employed before, promises some chance of our being able with more certainty to overcome this very threatening concomitant of pregnancy.

On June 9th, 1874, I was summoned to a lady, thirty-five years of age or thereabouts, to consult with two other practitioners already in attendance. She was about six months gone in pregnancy, and was so reduced by almost incessant vomiting that great fears were entertained as to her safety. I noticed there was slight uterine action accompanying the sickness, and, on examination, I found the os uteri partially dilated so as readily to admit the finger. I thought it right under the emergency to advise bringing on labour without delay; the gentlemen present, however, expressed no little apprehension as to whether or not she would have strength to undergo the effort of parturition on account of the very depressed and exhausted state of her system. They nevertheless concurred in the advisability of the course I recommended, and asked me to perform the operation. I at once dilated the os uteri as much as I could with the finger, and could feel the membranes and the head of the child. I tried to rupture the membranes with a telescopic female catheter (the only instrument at hand), but they were so flaccid and the head offered so little resistance, the catheter shortening itself also on my making pressure, that

I could not succeed; and, thinking it wise to wait awhile before resorting to any other expedient, we retired to another room for further consultation. In about an hour, we saw the patient again, and were surprised to find that a longer period had elapsed without sickness than before; and we again waited, in the hope that she might be able to take a little nourishment, and so be better prepared to undergo any further proceeding. We waited another hour, and another, but there was no return of vomiting; and we spent the rest of the night in watching, during the whole of which time she was improving, and we determined to let well alone. I left her early in the morning, and had a favourable account of her a few days afterwards. There was no return of sickness; she went on to the full period of pregnancy, was then delivered of a healthy child, and made a good recovery.

This case made a strong impression on my mind; and I wondered whether the relief to the vomiting, so urgent and threatening to her life, could have been effected by my having dilated the os uteri, and thus removed any undue tension that might be producing sympathetic irritation. It was not very long before I was called some distance into the country to consult about another case of vomiting during pregnancy of great urgency, occurring about the second month. The surgeon in attendance had adopted the best acknowledged medical treatment, and had arrived at the conclusion that artificial delivery would be necessary to save her life. With the full recollection of the former case, I examined the uterus, and found some degree of anteversion and the os patent enough to admit the end of my finger. I forthwith dilated it as much as I could, passing my finger all round, removing all puckering and making a smooth edge. She vomited only once slightly after this proceeding, and we left her with the understanding that, if the sickness continued, I should be summoned again in a few days to bring on abortion. This summons never came; but in about a fortnight I had a letter from the husband, stating that his wife began to get better an hour or two after I left, and that the sickness had entirely ceased. I have heard several times since that the patient is going on remarkably well, and I believe she expects to be confined some time this month.

A third opportunity since has offered itself for a trial of this novel (as far as I know) treatment. On the 6th of this month (April 1875), I saw, in consultation with a very intelligent country practitioner, a lady in delicate health just entering the eighth month of pregnancy. She was the mother of nine or ten children, and her life was valuable. Generally during early pregnancy, and sometimes for several months together, she had been troubled with vomiting; but during the last three

weeks, the sickness had been almost incessant; she could keep nothing down, and was in a very feeble and emaciated condition. She had moreover a considerable amount of albumen and some pus in the urine, a few casts also; and fears were entertained of there being extensive kidney-disease. There was, however, no dropsy, and our opinion was somewhat modified by the knowledge that the urine does often, during pregnancy in the latter months, contain a good deal of albumen. The patient was so ill, that she would willingly have consented to artificial delivery, if really necessary. I examined the uterus, and, as in the other cases, found it patent, puckered, and dilatable, and I dilated it as much as I could with my finger in the hope that the sickness might cease after such a proceeding. I should say that the usual remedies had been carefully employed without producing the desired effect. A few days after my visit, her husband called upon me to say that his wife had no return of sickness after I left, and was now able to take food without inconvenience, although he still thought her very weak and ill, and feared she would not recover.

On the 23rd, I received a very satisfactory letter from the surgeon in attendance to the following effect. "I am exceedingly glad to tell you that Mrs. — was confined yesterday. I should think it is not more than an eight months' child, still it looks healthy and strong. You may most certainly add her case to the others you related to me. *There was never any urgent sickness after you dilated the os uteri*, and the last week Mrs. — has frequently taken with relish and no inconvenience solid food, such as boiled mutton, with asparagus, and drank home-brewed beer. This morning she was going on quite well; she was not even faint or at all exhausted after her labour. I am very glad I called you in, for I now know how to proceed with cases of sickness in pregnancy. Should I meet with any more patients, I will either ask you kindly to meet me again, or report them to you."

This subject appears to me of so much importance, that I send my cases for publication without waiting for further experience or attempting to explain the *modus operandi* of the treatment suggested. It is my intention to communicate further on the matter when I have more thoroughly digested it myself; and I will not fail to report any future success or failure that may come under my observation. I trust, moreover, that others who may be induced to pursue the same plan of treatment will report their experience for the guidance and instruction of the profession.—*British Medical Journal*, May 15, 1875, p. 637.

77.—A NOVEL TREATMENT OF OBSTINATE VOMITING IN PREGNANCY.

By Dr. JABEZ THOMAS, Swansea.

On December, 21st, 1868, I was called to see the wife of Captain M., who had just returned from a sea voyage around Cape Horn ; she was thirty-two years of age, and seven months gone in her fourth pregnancy, naturally strong and robust, but now much reduced by incessant vomiting. The usual remedies—hydrocyanic acid, soda and calumba, and the nitrate of cerium—were prescribed for a few days to allay the gastric irritation, without the least effect, and not the smallest quantity of nourishment (such as milk and lime-water) could be retained. On the 24th, her condition became so precarious, that I suggested premature delivery ; and, on consultation with another practitioner, this view being concurred in by the gentleman called in, I proceeded to the induction of premature labour by means of Barnes's bags, having first dilated the os as much as possible by the finger. When I saw her the same day, I found her condition much improved, having retained the medicine and some nourishment ; I, therefore, removed the bag, and refrained from further interference for the present. About 5 a.m. on the following morning, I was sent for in a great hurry, and found she had been delivered by spontaneous expulsion of a male child, which only survived a short time. On inquiry, I found she had slept tolerably well during the night, and was aroused from her sleep by a slight pain, and found that the child was born immediately afterwards. She made a rapid recovery, and was out of bed in about a fortnight. I was struck at the time with the sudden cessation of the vomiting and her general improvement, which I attributed at the time to the means employed to allay the gastric irritation ; but I am now led to think with Dr. Copeman, that probably the urgent symptoms were due to undue tension, and that the introduction of the bags into the os uteri may have been the immediate cause of relief. It is certain that, after the introduction of the bag, there was little or no vomiting. I am led to think that this was a case of vomiting due entirely to the pregnant state, and not to the combined effects of sea-sickness and the vomiting of pregnancy, from the fact, that this lady had been in the habit of going to sea with her husband, and was never much troubled with sea-sickness, and was subsequently confined at sea of a healthy child about a week before her arrival at Antwerp, the vessel having been longer on her passage than was expected ; both mother and child did well. In conclusion I would remark, that I have found the nitrate of cerium (as recommended by the late Sir J. Simpson) most bene-

ficial in the vomiting of pregnancy.—*British Medical Journal*, May 29, 1875, p. 707.

78.—THE RELATION OF THE DISCHARGE OF OVA TO THE PERIOD OF MENSTRUATION.

The interesting question of the relation of the discharge of ova to the period of menstruation has recently been the subject of a paper by Dr. John Williams, of University College Hospital, which has been read before the Royal Society. It was not till a comparatively recent period that the connexion between menstruation and the discharge of ova was ascertained, and we owe to M. Coste the determination of the fact, that though the rupture of a Graafian follicle is usually synchronous with the epoch of menstruation, the coincidence in point of time between the two is not absolute; for cases are on record where menstruation has occurred, yet in which the minutest investigation has failed to discover the presence of a ruptured sac. Nevertheless, in the great majority of cases there can be no doubt that the escape of an ovum from the ovary and the discharge of blood from the uterus are associated events. The point that Dr. Williams has endeavoured to determine is, at what period in the course of the month the separation of the ovum takes place. He has had the opportunity of examining a series of cases, in all of which the period of menstruation was known. In some of these a Graafian follicle had been matured and had actually ruptured. In others, a Graafian follicle had been matured, and hemorrhage had taken place into the cavity, but no actual rupture had occurred. In one case a Graafian follicle had matured, but neither rupture nor hemorrhage had actually occurred; and, lastly, in three cases no Graafian follicle had become enlarged to the size exhibited by it at maturity. From his observations, Dr. Williams has come to the conclusion that, in the great majority of cases, the discharge of ova takes place *before* the appearance of the menstrual flow with which it is connected; for in ten out of fourteen cases rupture of a follicle or hemorrhage into its cavity had occurred before the return of the catamenia; in one it was doubtful whether rupture of a follicle or the appearance of the discharge would have taken place first; in two a menstrual period had passed without the maturation of a follicle; and in one a periodical discharge was imminent, though the ovaries contained no matured Graafian follicle. It is not improbable, he thinks, that the follicles which were found in the last three cases, and which were enlarged to the size of a small pea, would have become mature by the next

return of the flow. An interesting point was long ago made out by Coste, that in rabbits the excitement of the act of intercourse, and even of the desire to copulate, makes a difference in the period at which the Graafian follicles rupture, since when two sets of these animals were examined, one of which had been allowed access to the male and were taken away before connexion, whilst others were not allowed to see the male, the follicles, when the animals were killed, ten or twelve hours after, were ruptured in the former and unruptured in the latter.—*Lancet*, Oct. 23, 1875, p. 605.

79.—ON THE PERIODICAL RENEWAL OF THE MUCOUS MEMBRANE OF THE UTERUS.

By Dr. JOHN WILLIAMS, Assistant Obstetric Physician to University College Hospital.

The numbers of the Obstetrical Journal for February and March contain an account by Dr. Williams of some very carefully conducted investigations into the minute anatomy of the mucous membrane of the uterus, with special reference to the changes which are coincident with the phenomena of menstruation.

Until quite lately, menstruation was generally thought to be due to a periodic congestion of the uterus—a form of erection—and that during the interval the organ was in a passive state. More recent observers have shown that the period of uterine activity occupies a longer time than had been previously supposed; they believe that the organ is in an active state of preparation for some time before the actual flow appears, and that another interval elapses after its cessation before the organ returns to a state of rest. Dr. Williams shows, however, that there is no period of rest, that the menstrual flow is only the terminal phenomenon of a cycle of changes which require for their completion the whole intermenstrual period. He gives a detailed account of these changes, as shown by a careful examination of the uteri of twelve women who had died at different known stages of the menstrual or intermenstrual period. Starting from a time just antecedent to the appearance of the menstrual flow, the cycle of changes shown by these twelve specimens is briefly as follows.

1. Acute fatty degeneration of the uterine mucous membrane; this is well marked before any extravasation of blood appears. It begins just inside the internal os, and extends upwards.

2. Beneath this degenerating membrane the subjacent muscular wall is congested, and covered with a layer of actively proliferating cells—the first step towards the formation of a new lining membrane.

3. The hemorrhage next appears; Dr. Williams believes that this is partly due to the fatty change in the mucous membrane and the active congestion of the subjacent tissue, and partly to muscular contraction of the uterus itself. He finds that the cavity of the organ when menstruation is over, though larger than usual, is smaller than it would be after removal of its lining membrane had not contraction taken place. He found also that, in specimens examined during the flow, the muscular wall was firm and pale, while the peritoneum and broad ligaments were congested. He thinks, therefore, that the contraction of the uterus drives the blood from the muscular wall into the mucous and serous membranes; the contents of the glands and the greater part of their lining epithelium are expelled at the same time.

4. When hemorrhage has taken place into the degenerated membrane, it undergoes rapid and complete disintegration; in some cases it is entirely removed in three or four days, in others the process occupies seven or eight days.

5. During all this time cell-formation proceeds actively in the subjacent layer; three days after the cessation of the catamenia the lower two-thirds, and at the end of a week the whole, of the body of the uterus is lined with a thin mucous membrane, covered by a fresh growth of columnar epithelium. It is, however, at first of a very rudimentary character, and it is not till just before the period of the next flux that the membrane becomes structurally perfect. If impregnation now occur, it undergoes further development, but failing this, the same series of changes again commences. Menstruation is, therefore, due neither to congestion nor to a species of erection, but to a molecular disintegration of the mucous membrane of the body of the uterus, accompanied by hemorrhage. The paper is illustrated by some beautifully executed drawings, showing the microscopical appearance of the uterine mucous membrane at different stages of this physiological process.—*London Medical Record*, April 21, 1875, p. 247.

80.—ON NEURALGIC DYSMENORRHEA.

By Dr. CHARLES R. DRYSDALE.

The author thought that a salutary revolution was now setting in against the surgical doctrines held by Dr. Marion Sims and others upon dysmenorrhea and its causes. Dr. Drysdale very rarely indeed witnessed any case where he had found any service to arise from operations on the uterus; whilst he had seen some cases of pelvic abscess and pelvic peritonitis occur from such interference. He was lately consulted by a patient, single, aged thirty-two, who had suffered since the age

of sixteen from dysmenorrhea, and who, on consulting two eminent specialists, was advised by the one to have recourse to incision of the cervix, and by the other to wear a pessary. In this case, the uterine sound passed in its normal direction without difficulty, and the patient had no leucorrhœa nor prolapse of the organ, which was quite normal in size. There was no ulceration of the os uteri, although another eminent specialist had considered this as the cause of her dysmenorrhea. The author held that there was still too great a tendency to expect to find an evident physical cause for all painful menstruation. Spasm and neuralgia were quite sufficient to account for the vast majority of cases. Membranous shreds, also, were frequent causes of obstruction to the monthly flow. An illustrative case was recorded. The rational treatment of dysmenorrhea commencing at an early period, consisted not in the use of pessaries, or of incision of the uterus, surely; but in the use of cold baths in the morning, with short walks in the open air afterwards; in hot baths, a few days previously to the menstrual periods; and in palliative treatment of the paroxysms by means of antispasmodics at the epoch of pain. Marriage sometimes cured such cases at once; at other times, it was of no use.—*Obstetrical Journal*, Oct. 1875, p. 475.

81.—ON THE POSTURAL TREATMENT OF PROLAPSUS OF THE FUNIS UMBILICALIS.

By Dr. JOHN BRUNTON, M.A., Medical Officer to the Great Northern Railway Company, and Surgeon-Accoucheur to the Royal Maternity Charity.

Prolapse of the funis is an accident which, while it produces comparatively no danger to the life of the mother, is exceedingly hazardous to that of the child.

In the great majority of cases, if the prolapse is permitted to continue till the delivery of the child is accomplished by the natural efforts of the mother, death of the child results,—the cause of death being obviously from pressure which obstructs the fetal circulation, “as surely as if breathing were prevented after birth.”

Occasionally we meet with cases in which, the funis being prolapsed, delivery takes place, and the child is born alive; these cases, rare as they are, occur in women who have large pelves, with soft and dilatable parts, and in whom the delivery is very rapid. But in the greater number of cases death is sure to follow, if we do not protect the funis from pressure, or deliver the child with a measure of rapidity,—in other

words, subject the cord to pressure for as short a time as possible.

I here enumerate, as briefly as possible, the various causes of prolapse as set down by various authors on obstetrics:—

1. An excessive amount of liquor amnii, the child being of the ordinary size.

2. The same cause, with a small child.

3. A wide pelvis, with ordinary sized child.

4. A wide pelvis, with small child, and with this, the presence of twins.

5. Malposition of the fetus, as shoulder or arm presentation, which does not permit the circular os uteri at all points to closely embrace the presenting part, on account of its irregularities.

6. Deficient action of the lower segment of the uterus, for “the uterus is the chief means by which the cord is prevented from falling down between the presenting part of the child and the passages, from the closeness with which its inferior portion encircles it; without this, from the erect posture of the human female, there would be a liability to prolapsus of the arm or cord in every labour.” (Rigby.)

7. For a similar reason to that of malposition, a narrow pelvic brim—the funis is apt to float down with the escaping liq. amnii.

8. Position of the placenta near the os, and therefore low insertion of the cord.

9. Length of cord; if very long. (I have seen it sixty-three inches.)

10. Dropsy of the cord, and therefore excessive weight of it.

These are the principal predisposing causes. The usual exciting ones are—

1. Sudden large gush of liquor amnii, when rising to the erect posture.

2. Early rupture of the membranes when the child is small, premature, or malpresenting.

It is not necessary to say anything about the *diagnosis* of prolapsed funis, for it is easy; and as to *prognosis*, we all know from the multitude of cases detailed by obstetric authors, and the anatomical relations of the parts concerned, that it is very serious as regards the child.

As to treatment, all authors are agreed, that if the funis presents with the membranes unruptured, it is wise and prudent to let it alone; for it is obvious that while the waters are retained, but slight (if any) pressure can be exerted on the funis. At all events, it is hardly possible for the child to be destroyed by the compression in such circumstances.

But if the liquor amnii has escaped and a loop of funis presents, what is to be done?

We must either protect the funis from compression until natural delivery occurs, or relieve it from pressure as speedily as possible.

Now what are the available resources for such procedure?

I. Drs. Smellie, Gooch, Denman, Hamilton, Dewees, Burns, Campbell, and a host of authors recommend version, and show an amount of success, provided the membranes have not been ruptured and the parts are dilatable. Indeed, Mauriceau, in thirty-three cases recorded, turned nineteen times, and lost only one child; but in this case there was an arm presentation requiring version. Many others have been very successful in a similar way.

It is true that by version delivery is usually completed very rapidly, and in a much shorter time than it would be otherwise. This is an advantage certainly, but the risk at the same time is great, for every one knows the large percentage of infant deaths in breech and footling (natural) cases as well as after the operation of version. There is not a complete protection of the cord from pressure. There exists a considerable amount of danger to the child. How often have we been disappointed in version and in breech and footling cases, when the body of the child has been delivered, the pressure of the head upon the cord has been fatal to the child, and this especially in *first* cases, where if I mistake not, the mortality is as high—two in three.

But it is curious to note how Dr. Denman qualifies his recommendation to turn in prolapse, he says, “no attempts to save the child are on any account to be made, but such as can be practised without the chance of injuring the mother.”

Now we come to the gist of this question—viz., treatment by version. It is advised *before* the membranes have been ruptured; at this period there is little or no danger to the cord. But if the membranes have been ruptured, and the liquor amnii has drained away, with the uterus firmly clasped round the fetus, and the cord in the vagina, is turning advisable? is it safe? or is it safer than other means? or are other means safer than turning? Every one of us who has any experience, knows what risk the mother runs in the operation of version in such circumstances; and every accoucheur who has practised the operation, understands the difficulties to himself, the pain and the unpleasantness; certainly chloroform is an aid of great value, but one has not it always at hand, or does not feel justified in administering it. At the same time is the risk to the child lessened? For my part I think the risks are increased both ways, for the very introduction of the hand, which must, according to Dr. Rigby, be “done with the greatest possible

caution," adds to the pressure on the cord, and the very operation of changing the axis of the child, and the withdrawal of the operator's hand, with the foot, subjects the prolapsed cord to additional risk; while to crown the whole, we have yet to resign the cord to the pressure that accompanies the delivery of the body and head.

Dr. Merriman lays down certain conditions in which it is, in his opinion, justifiable to turn. These are supported by Dr. Ramsbotham—viz., when pulsation exists in the cord, the head not having yet entered the pelvic brim; when the pains are not strong, and the soft parts are relaxed and dilatable. Though it is not possible to lay down an exact rule for every case, each should be judged of on its own merits, and the accoucheur is bound to use due deliberation and caution; not a deliberation of such a hesitating character, as to allow sufficient time to pass, for the pressure on the cord to jeopardize the infant or prove fatal to it.

On the whole, whether the membranes are ruptured or not, my opinion is against version, because I shall show that we possess a much more reliable means of treatment, in every sense of the word, safe for the infant, and safe for the mother. If we have these means, it is our bounden duty to employ them. While in the great majority of cases version is, as a means of treatment, to be excluded, still, we might find it on some rare occasion useful, and it is not to be forgotten it was successful in the hands of Mauriceau. Obviously in complex presentations with the funis, it is the only method to be employed—such as, arm with funis, *placenta prævia* and funis.

The question of version, and the unavoidable pressure on the funis, suggests a most important question, which has a very strong bearing on all the methods of treatment—viz., How long is compression of the cord necessary to cause the death of the fetus? I have searched a number of obstetric works, and in only one—viz., Dr. Alex. Hamilton's, of Edinburgh (1784), have I found a time mentioned; he says, "a pressure on the umbilical cord perhaps for ten minutes, by interrupting the circulation, will be sufficient to destroy the life of the child."

This time seems far too long, for I am sure in our experience in versions, for example, two minutes' pressure, from non-delivery of the head, has been quite sufficient to destroy the life of the fetus. Notwithstanding there are cases on record and to be met with, where the prolapsed cord has apparently ceased to pulsate, and yet the child has been delivered in time for its resuscitation. Dr. Tyler Smith especially notices this fact. He says, "cases are on record in which the cord, being pressed upon from above, the loop hanging down is pulseless from pressure on the arteries, but the heart may beat for a consider-

able time after this, and the child be ultimately born alive." These cases unfortunately are rare. Sometimes change of posture of the cord allows the otherwise feeble heart to rally, and the pulsation of the cord is restored.

II. We now come to the next position. The membranes have been ruptured, the cord prolapsed, and the head is fairly engaged in the cavity of the pelvis. If the os is fully dilated turning is out of the question, or at least not much in it. What is to be done? Most authors, from early days, recommend the application of the forceps to complete rapid delivery. Many lives have been saved in this way. Care must be taken not to enclose the loop of cord within the blades of the forceps. "The extraction must be as rapid as is consistent with the mother's safety."

It is obvious that in primiparous cases delivery cannot be effected with sufficient rapidity without great danger to the maternal parts. Also, as a great many cases of prolapse are in first labours, the applicability of the forceps must be limited for the above reason. What may be the exact proportion of prolapses in *primiparæ* I have not been able to ascertain; in my own limited experience, afterwards to be related, two out of five were such; elsewhere I found three in twelve.

Admitting the advantage of the forceps in certain conditions, have we any better means of overcoming the difficulty? When called to attend a labour we have not always a bag of instruments with us. Should prolapse occur, the delay which follows before procuring the instruments would be fatal to the child. But more anon.

III. The next method of treatment is that of reposition of the cord into the uterus, or if that cannot be done, to place the prolapsed cord in such a position that it shall be pressed upon as little as possible.

(a) This process was recommended by Dr. Merriman. The cord is to be brought into the oblique diameter of the pelvis, opposite to that occupied by the child. This procedure is said to be successful sometimes in *pluriparæ*, with large pelves and soft dilatable parts. Nevertheless, it is plain from the change that occurs in the position of the head during the progress of labour, that while the cord so placed may at one time be free from pressure, it is shortly subjected to it again and hazard arises. In *primiparæ* such measures are of little or no avail.

(b) Some recommend the pushing of the cord up in order to hook it over the chin. "No doubt," says Dr. Tyler Smith, "this answers the purpose if the cord will keep there." (c) Dr. Ramsbotham advises us to carry the loop up above the presenting part, and retain it there till the next pain comes on, *in the hope* that the head will be propelled somewhat downwards,

while the funis remains above. But he remarks, "we shall often be disappointed by the loop reappearing as soon as we remove our fingers." Is not this the experience of all of us?

(*d*) Next it is recommended to push up the loop and apply a piece of sponge or soft linen, "to act as a stay on which the loop may rest." This process has succeeded now and again. But is it certain? By no means. (*e*) Dr. Mackenzie enclosed the prolapsed cord in a leathern purse, and carried it up into the uterus. The operation is, however, difficult, and one now rarely if ever attempted. (*f*) Dr. Michaelis, of Kiel, suggested and used a gum elastic male catheter, to which he attached, by ligature, the loop of cord, passed the catheter and funis up into the uterus, withdrew the stilette, and allowed the catheter to remain during labour, being soft it did no harm. He has since abandoned this process for the use of the fingers. Of other mechanical means, some of which are ingenious enough but complicated, I need only mention that introduced by Mr. Perkins, of Exeter, in 1843. (*g*) It is described by Dr. Ramsbotham, in his treatise on Obstetric Medicine and Surgery.

The danger that arises in the employment of the mechanical contrivances is due to the ligature; the cord is very slippery, and necessitates some compression to retain it in Mackenzie's bag, to attach it to Michaelis' catheter, as well as to Perkins' whalebone; at the same time there is another danger in the last procedure — viz., in withdrawing the tape, which must necessarily be wet, an amount of friction ensues which obstructs the ready passage of the tape and compresses the cord. I would suggest that it might be well to grease the tape before use, if this method be had recourse to by any one.

Dr. Ramsbotham says that we can easily get, on the spur of the moment, a piece of whalebone, "wherever women are present." I presume he means a piece from an attendant's corset; but, in these days of steel corsets, I am afraid there would be great difficulty in getting the whalebone.

I said that we had not always the forceps with us; neither is it likely that we can always carry an instrument designed for reduction of prolapsed funis, seeing that the accident is so rare (1 in every 276 cases). Have we any other means available?

IV. I alluded above to the unsatisfactory result of simply reducing the cord by the hand. Yet the hand is the best and readiest instrument, and always available. I also hope to show that no other instrument is necessary for successful reduction of the cord.

Sir Richard Croft advises us to carry up the loop of cord, and suspend it over one of the limbs of the child. He was successful in a few cases. The difficulty of accomplishing the object, as well as the risk to the mother in introducing the

hand into the uterus, detracts very much from the value of this operation. Indeed, having introduced the hand into the uterine cavity, one might as well go on to complete version.

Before proceeding to describe the methods which, when understood, will claim precedence of all others, I may mention that it is quite unnecessary to operate upon the cord, provided the cord be long lapsed, cold, and pulseless; it is then advisable to let the case terminate naturally, if the presentation is natural. Other measures of course are to be taken according to circumstances.

Notwithstanding, as I have mentioned above, there are cases in which it is advisable to reduce the cord, though it be apparently pulseless, if the prolapse is of short duration and the fetal heart can be heard "per abdomen" still beating, if the pressure can be taken off the cord, the circulation may be restored and the child saved.

Indeed, in spite of what I have said above, it is justifiable to reduce the cord in all cases, if there be no risk to the mother, in the hope of saving the child.

It is very interesting in following out the various methods that have been suggested for reduction of the prolapsed funis, to notice that at intervals some approach has been made towards that process which I am now going to advocate as the best, the safest, and most sure—the *postural method*.

In 1784, Professor Alexander Hamilton, of Edinburgh, says, "the best practice, therefore, is to take the earliest opportunity that the circumstances of the case will admit of, to reduce the cord by placing the woman in a proper position, so that the hand of the operator may be carried up, in the absence of pain, into the pelvis, and the cord entirely reduced."

Unfortunately, there is no mention made by him of the *proper position*; and so we are left in the dark as to his exact meaning and mode of procedure.

Next, Drs. Hardy and M'Clintock approach the true postural method very nearly. They advise, that in attempting manual reduction, the woman should lie upon the side opposite to that on which the cord protrudes—i.e., if the cord be felt on the right side of the pelvis, the woman should lie on her left side, and *vice versa*. By this means a certain amount of backwards and downwards (with reference to the mother's position in bed) inclination is given to the cord, and it may slip up and be retained.

If the cord slip out anteriorly, there is little or no chance of its being retained *in situ* when the mother is placed on her back. But take the opposite position to this; let the cord slip out posteriorly, reverse the mother's position—let her be placed on her knees with her head low down on a pillow, "after the

manner of eastern worshippers," and the difficulty can easily be overcome.

It is somewhat astonishing how near one may approach the desired end and yet not reach it. Not until Dr. Thomas, of New York, read his paper on postural treatment of prolapsed funis has the desired end been achieved (1858).

Dr. Thomas thus describes the history of the operation, and the manner in which it is performed:—"In a course of lectures," he says, "on obstetrics, delivered by me in the University Medical College of this city, about two years ago, I closely investigated this subject, and came to the following conclusions:—*First*, That the causes of the persistence of this accident (whatever may at first have produced it) reduced themselves to two—the slippery nature of the displaced part, and the inclined plane offered it by the uterus, by which to roll out of its cavity; and, *Second*, That the only rational mode of treatment would be inverting this plane, and thus turning to our advantage not only it, but the lubricity of the cord, which ordinarily constitutes the main barrier to our success. This, I found could be readily accomplished by *placing the woman on her knees, with her head down upon the bed*, in the posture assumed by eastern nations in worship, and now often resorted to in surgical operations upon the uterus and vagina. Let it be remembered that the axis of the uterus is a line running from the umbilicus, or a little above it, to the coccyx; and it will be seen that, by placing the woman in this position, it will be entirely inverted."

Advantage here is taken of the (a) Slippery nature of the cord; (b) The action of gravitation; and (c) The peculiar way in which the lower segment of the uterus contracts when a pain is coming on—viz., by commencing the contraction in the neck, and gradually passing upwards, so that when the cord is pushed up by the hand just as contraction is coming on, the very action of the cervix itself, so to speak, sucks back the cord that had been prolapsed, and by the closeness of its contraction prevents the cord from falling down again between the presenting part of the child and the passages.

Before appending cases treated by the "postural method," I may mention that in some cases where the knee-elbow position cannot be had recourse to, we can substitute a modification of Drs. Hardy and M'Clintock's process. Taking advantage of their suggestion—viz., of placing the mother on the side opposite to that on which the funis has prolapsed—we can add greatly by elevating the mother's pelvis by putting pillows under her, and lowering her head and shoulders. It is quite obvious that, in the case of a stout, thick-set, apoplectic-

looking woman, the postural method might be fraught with some danger.

I now subjoin some cases :—

Case 1.—On July 12th, 1868, at half-past 11 p.m., I was called to attend Mrs. K. in her fourth confinement. Labour had set in slowly about midday, and gradually increased in severity. On my arrival the pains were active; the vertex was presenting; no liquor amnii had escaped. In a quarter of an hour a male child was born naturally, and separated in the usual way. Having noticed that the mother's abdomen was very large, and that no liquor amnii had escaped with the child, I suspected twins; and, on examination, detected a second child, with the head presenting, the membranes entire. The os uteri being well dilated, I ruptured the membranes, when a gush of liquor amnii took place. On examination, I now found a large loop of a second funis prolapsed. As it was necessarily under severe pressure during each pain, I resolved to try reduction of the cord by the *postural method*. Placing the mother on her knees, with her face resting on a pillow, I passed my hand into the vagina, pushed up the prolapsed loop of cord, and waited till the uterus contracted. I then had the satisfaction of finding that the cord did not come down again; and *in a few minutes* a live female child was born. I may mention that I reduced the cord once or twice before trying the postural method, but it prolapsed with each pain.

Case 2.—On October 26th, 1869, I was called to attend Mrs. H., aged twenty-seven, primipara. She had been ill ten hours. Pains active; occurring every few minutes. On examination, I found the os uteri dilated to the size of a crown piece, the head presenting, a bag of membranes protruding, and in this bag was a loop of funis. Finding no pulsation in the cord, I thought it proper to at once reduce it, in the hope of saving the child. Placing the patient in the knee-elbow posture, with little difficulty I partly introduced my left hand into the vagina, ruptured the membranes, and just as a pain was coming on, pushed up the loop of cord (six inches in length) alongside of the head, and, as the uterus contracted and the head was forced down, the cord slipped out of reach, and was not again prolapsed. I did not keep the mother two minutes on her knees. She had a tedious labour, with a narrow pelvic outlet, and was delivered by forceps some hours after. The child was dead. There was extensive disease of the placenta—calcareous and fibrous. The mother said she had not felt fetal movements for some days. The mother made a good recovery.—*Obstetrical Journal*, April 1875, p. 16.

82.—ON RETROVERSION OF THE GRAVID UTERUS.

By Dr. LOMBE ATTHILL, Obstetric Physician to the Adelaide Hospital, Dublin.

Retroversion of the uterus is not, at least in its complete form, a displacement of frequent occurrence; doubtless partial retroversion, by which is to be understood that condition in which the fundus inclines more or less backwards, the whole organ lying in a sloping direction across the pelvis, the os being still, however, its lowest point, is not very rare; but this partial version of the womb seldom gives rise to distressing symptoms, and consequently, as a rule, escapes notice. But true, complete retroversion is of infrequent occurrence. But although this displacement is comparatively rare, still it is an affection of great importance, not only from the gravity of the symptoms it gives rise to, and the serious and even fatal consequences which may result from its occurrence, but also because of the frequent errors of diagnosis made in relation to it.

In retroversion the uterus, as the name indicates, is turned completely backwards, the os uteri looking upwards and forwards, the fundus lying in the hollow of the sacrum, and sometimes almost on the perinæum.

It is of importance that you should clearly understand the difference between retroversion and retroflexion of the uterus. In the former the whole organ is, as I have explained, turned over; in the latter it is flexed, or bent at a point usually corresponding to the os internum. These two very distinct affections are frequently spoken of as identical, or at most as differing only in degree.

Retroversion, at all times a rare affection, is still more rarely met with unconnected with pregnancy. It generally occurs about the end of the third month of pregnancy, and the first symptom it gives rise to, almost invariably, is retention of urine. You will be asked to see a woman in the third or fourth month of pregnancy, who will tell you that she is unable to pass water, and on examination you will find the bladder to be distended with urine. On emptying it, you will on a further examination find that a globular body occupies the hollow of the sacrum and that the os uteri is high up behind the pubes, possibly altogether beyond your reach; at the same time, a bimanual examination will prove the uterus to be absent from its normal position. But possibly the patient may tell you, as in the case at present under our observation, that she is able to pass water, nay more, "that it is always coming." This is a statement which constantly misleads inexperienced practitioners; the dribbling of urine is under such circumstances but the overflow of a too greatly distended bladder, and if you

fail to recognise this, and promptly to empty the bladder, your patient's life will be endangered, possibly lost. She may die of peritonitis, or of uræmic poisoning, or the mucous membrane of the bladder may become softened and subsequently gangrenous, and death ensue.

The causes producing retroversion of the uterus are various. Frequently the displacement appears to take place suddenly. A pregnant woman makes an effort such as that requisite to lift a heavy weight, and immediately experiences some pelvic distress. By-and-by she finds that micturition is impossible, and on examination retroversion is found to exist. The conclusion is that the displacement took place on the moment. I doubt if this explanation is ever perfectly correct. Most probably the uterus had been, ever since, probably before the occurrence of pregnancy, lying in an abnormal position—namely, more or less across the pelvis, and that the sudden muscular effort, the bladder being at the time distended, merely completed the displacement which had previously been in gradual progress. The subsequent retention of urine is the result of two causes—one, that the posterior wall of the bladder is drawn down by the uterus, to which it is attached; the other, that the neck of the uterus presses upon the urethra, and thus obstructs the flow of urine. But in some cases the patient cannot assign any cause for the production of the distressing symptoms from which she suffers. There may have been a gradually increasing difficulty in evacuating the contents of the bladder, till finally that cannot be effected at all, or at most, but partially, only a very small quantity of urine being voided at a time. What has occurred under such circumstances probably is this: the patient, previous to her becoming pregnant, may have been the subject of retroflexion of the uterus; pregnancy occurring, the fundus of the uterus, as it enlarges, instead of rising, sinks gradually lower, drawing down with it the posterior wall of the bladder, the flexion in time being thus converted into a version. This, however, is, I believe, of very rare occurrence. I have, on the contrary, frequently known patients, the subjects of retroflexion of the uterus, to become pregnant, and have observed that as utero-gestation advanced, the fundus gradually rose, and finally assumed its normal shape and position. Dr. Barnes believes that this is effected by the gradual enlargement of the fundus upwards, there being no obstacle to its growth in that direction, and that thus, in time, the pelvic portion is partially “drawn out of its lodgment.”

Cases of retroversion of the gravid uterus usually terminate in one of three ways:

1. The uterus may be raised above the promontory of the sacrum and utero-gestation proceed normally ;
2. Abortion may occur ; or,
3. Death may ensue.

I shall here detail for you the particulars of the case of the patient at present in hospital, as she is likely to afford an example of the first and most favourable termination of this displacement, and it will also, I think, impress on you deeply, the importance of being able to recognise the affection, for this woman had been under treatment for some time before she came under my care, without the true nature of her case being suspected.

A. M., a married woman and the mother of five children, was admitted into hospital a fortnight ago, evidently suffering great pain. She stated that she had a "tumour" in the abdomen, which had existed ten or twelve days, during the whole of which period she had been in constant pain. For some time previous to the formation of this "tumour" she had, she said, experienced a good deal of discomfort, or rather distress, which was greatly increased by a constant desire to pass water, her efforts to do so being but partially successful, only a very small quantity of urine being voided at a time. Latterly however, her condition had undergone a great change: there was now incontinence of urine, or, to use her own words, "it was constantly coming from her;" nevertheless, her sufferings were, if possible, more intense than ever. On passing the hand over the abdomen, a well-defined tumour could be felt above the pubes, pressure on which caused great pain. A vaginal examination detected another tumour lying in the hollow of the sacrum, and almost resting on the perineum. The os uteri was absent from its normal situation, lay high up behind the pubes, and could not be reached without the greatest difficulty. On questioning her, she stated that, though a married woman, she did not think she was pregnant, but on being pressed on this point, admitted that she had not menstruated for at least ten or twelve weeks. On proceeding to pass a catheter, she objected, stating that this had been done the day before, and that she was told that there was no water in the bladder. However, being satisfied that this statement must be incorrect, I persisted, using for the purpose an ordinary No. 9 gum-elastic catheter, and drew off about two quarts of turbid, highly ammoniacal urine. The diagnosis was now clear and a careful examination verified my previous impression, that I had to deal with a case of complete retroversion of the gravid uterus.

The thorough emptying of the bladder was followed by much pain, and fearing that peritonitis might supervene, I desisted for a time, after one ineffectual attempt, from any

further effort at replacing the uterus in its normal position, and with the view of allaying the pain which this woman suffered, administered half a grain of morphia, in the form of a suppository.

After the lapse of eight hours, I found her in a comparatively satisfactory condition. She had slept, and the pain had nearly altogether subsided. The bladder was now again emptied, and the patient being placed in the ordinary obstetric posture, on her left side, I proceeded to endeavour to raise the uterus. For this purpose I introduced two fingers of the right hand into the vagina, and made steady pressure on the fundus, directing it upwards and rather to one side. Such of you as were present will remember the stress I laid on the apparently trifling point of making the pressure laterally, instead of directly upwards: by so doing the promontory of the sacrum, which often opposes a serious obstacle to the ascent of the fundus, is avoided. In the present instance the effort I made, as described, was attended with complete success; the fundus yielding to the steady pressure, slipped above the brim, and remained there; the patient experienced great relief, and has since progressed favourably. The catheter was, however, used regularly night and morning for some days subsequently, for though the patient could pass water, she was unable to empty the bladder, and it was very desirable that no accumulation should be permitted to occur. This precaution—namely, that the catheter be passed twice a day, in all cases in which retention has continued for a considerable time, should never be omitted, otherwise the bladder may not recover its tone. The subsequent history of this patient presents no point of interest; pregnancy is proceeding normally, and there is no reason to suppose that she will not go to her full time.

This fortunate termination is not, however, to be frequently expected, in the great majority of cases in which retroversion of the gravid uterus takes place, abortion occurs either as a direct consequence of the accident or as a result of the treatment necessary to effect reposition; therefore, be always careful to give a guarded prognosis. Thus, not long since I was urgently requested to visit a lady who, in the twelfth week of pregnancy, suddenly discovered that she was unable to pass water. I found her in great agony, having for some hours endeavoured ineffectually to relieve herself. She stated that she had always enjoyed the most perfect health; that on the morning of the day on which I saw her she had been engaged in superintending some domestic arrangements, during the progress of which she had assisted in raising a heavy box to a considerable height; that at the moment of making this effort she became conscious of “something giving way inside” her; and

but, as at the time she did not experience any discomfort, she thought no more about it, till after the lapse of some hours, being desirous to pass water, she discovered that she was unable to do so. By-and-by her sufferings from this cause became severe, and she sent for me. I at once recognised the nature of the case, emptied the bladder, and endeavoured to raise the uterus, which I found to be retroverted, above the brim, but my efforts were ineffectual. In this case I passed the catheter morning and evening, on each occasion of doing so, endeavouring by pressure on the fundus to replace the uterus in its normal position, and on the sixth attempt, that is, at the end of three days, succeeded in doing so. This patient seemed to go on well for a time, but after the lapse of ten days, a sharp dash of hemorrhage occurred, and she aborted. My belief is that in this case the force necessarily exerted to replace the fundus, and not the accident itself, was the cause of the abortion.

But abortion is not the result most to be dreaded—death may possibly follow. One fatal case occurred in my own practice. This patient was further advanced in pregnancy than either of those just alluded to, before her sufferings induced her to seek relief. It was her first pregnancy, and she was unable in any way to account for the displacement. The symptoms appeared to have developed themselves very gradually, and the difficulty of micturition to have been progressive, till finally it became impossible. As well as could be ascertained, she was, when I saw her, in the sixteenth week of pregnancy; the whole of the abdomen was very tender to the touch, and the retroflected uterus nearly filled up the true pelvis; the greatest difficulty was experienced in raising the fundus. This was mainly due to the size of the uterus: but I am also of opinion that the uterus was bound down by adhesions. Abortion occurred within twenty-four hours after the reposition of the fundus had been effected, and she died in a few days. I am of opinion that this may have been a case of congenital retroflexion, which, under the influence of pregnancy, was, as previously explained, converted into one of retroversion. The adhesions were of recent origin; probably local subacute peritonitis existed previous to the raising of the fundus, and that this subsequently spread over the whole abdomen and proved rapidly fatal.

In the treatment of retroversion of the gravid uterus, two indications are plainly indicated, one being to keep the bladder empty, the other to restore the uterus to its normal position. The former should always be effected by means of a long gum-elastic catheter, for an ordinary silver female catheter will often in these cases fail to reach the bladder, so greatly is the urethra elongated and displaced. The bladder being emptied,

it is generally advisable to attempt reposition at once, unless, as in the case first narrated, great pain is caused by doing so, under which circumstances it is wiser to allow some hours first to elapse, care being taken to pass the catheter at short intervals.

In the majority of cases, especially if pregnancy has not advanced beyond the twelfth or thirteenth week, steady pressure, exerted by means of two fingers introduced into the vagina, will be successful in raising the fundus, care being taken to make the pressure rather to one side, so as to avoid the promontory of the sacrum. Occasionally, however, you will fail to effect reposition by this means. When this is so you will sometimes succeed by introducing one of Dr. Barnes' india-rubber bags into the rectum, distending it with water, while pressure is still exerted by the fingers in the vagina. If these efforts fail in raising the fundus above the brim, no resource remains but to bring on abortion. This under the circumstances is best effected by introducing a catheter or sound into the uterus, and if possible rupturing the membranes, but sometimes, in consequence of the os uteri having been forced up behind the pubes, the introduction of a catheter or sound is impossible, and then, as a last resource, an effort should be made to lessen the size of the uterus by tapping it through the rectum by means of a fine trocar or aspirator. This has been done several times successfully; the liquor amnii having been evacuated through the trocar, abortion followed, the patient subsequently recovering; but in all cases of retroversion the tendency to abortion is great, and occasionally peritonitis supervenes. Bear in mind that, in addition to abortion, the possible occurrence of peritonitis is to be dreaded, and death may ensue from this cause. Retroversion, therefore, of the gravid uterus is always to be looked on as an accident of a very serious nature.

But supposing you have succeeded in raising the fundus, the patient will still, under the most favourable circumstances, need care for a considerable time. It is essential to attend to the state of the bladder, and to pass the catheter at stated intervals till satisfied that the organ has regained its tone, and you must watch lest the fundus of the uterus fall down again into the pelvis. To lessen the risk of this occurring, and also with a view of counteracting the tendency to abortion, you should for some time confine the patient strictly to the recumbent posture. As the uterus enlarges, the risk of a relapse lessens, and after a time becomes impossible, but the tendency to abortion for a long time continues, and in a comparatively small percentage of cases does the patient reach the full time of pregnancy.

Before concluding my remarks on this subject, I must say a few words on the question of diagnosis. In all the cases which have come under my observation in which an error in diagnosis had been made, no sufficient examination appeared to have been instituted; thus, with respect to the patient whose case I am specially alluding to, the fact that she was suffering from retention of urine was not recognised, although the enormously distended bladder could be easily felt above the pubes. This negligence is quite inexcusable. But it is just possible that an ovarian or other tumour occupying Douglas' space might be mistaken for a retroverted uterus, even though an examination had been instituted, especially if it were large enough to press against the urethra and thus obstruct the flow of urine; but in such a case the symptoms of pregnancy will probably be wanting, and, moreover, a careful examination will detect the uterus, which, under such circumstances, would probably have been forced up above the pubes, lying anterior to the tumour. Any other tumour, such as that caused by the sudden escape of blood into the recto-vaginal *cul-de-sac*, may, in like manner, cause some perplexity. All doubts, however, will be dispelled if, on emptying the bladder, the uterus is found lying anterior to the tumour. Excusable errors in diagnosis, then, in cases of retroversion of the gravid uterus, are possible, but with ordinary care such should rarely, if ever, occur.—*Medical Press and Circular*, April 14, 1875, p. 316.

83.—THE DIAGNOSIS AND TREATMENT OF PLACENTA PRÆVIA.

By Dr. CHARPENTIER.

Dr. Charpentier, in the Archives de Tocologie, gives some practical directions on this subject:—

If attention be paid to the following points, the diagnosis can be made without much difficulty. First, the time at which the hemorrhage first makes its appearance, viz., from the seventh to the eighth month, in some rare cases as early as the sixth month; the fact that it comes on suddenly, without any known cause, and stops as suddenly; and that it reappears at uncertain intervals, but in increasing quantities, up to the time of labour. Second, the absence of ballottement, the thick mass of the placenta being interposed between the finger and the foetal presentation.

The hemorrhage, in cases of placenta prævia, is always external; it takes place during the uterine diastole, but is expelled during the systole, and if the latter were continuous it could hardly take place at all.

Artificial delivery is a most dangerous method, only suited to most urgent cases. The rupture of the membranes is very good treatment, provided the os is partially dilated. It is hard to do when the presentation is complete. The use of ergot is a powerful auxiliary, but it increases greatly the danger to the child, and is contra-indicated in contraction of the pelvis, organic disease of the uterus, and mal-presentation.

The author looks upon the plug as the treatment *par excellence*. It requires to be applied skilfully to be of any great use. Charpie or tow are the best materials with which to plug, and if properly applied, the author considers such a plug superior to any description of india-rubber bag which can be introduced into the uterus and inflated. The great point to attend to when plugging is to introduce enough of the charpie or tow, as much as a pound and a half of the former material being sometimes necessary. The bladder and rectum should both be emptied before we proceed to plug. Some practitioners dip the first pledget in a solution of perchloride of iron. This is not necessary.

The charpie should be rolled into small balls, the first twenty or thirty of which should have a piece of thread attached. Before being introduced they should be well covered with cerate. This renders a speculum unnecessary.

The author lays great stress on packing tightly the anterior and posterior *cul-de-sac*, but especially the latter. The success of the operation depends to a great extent on this being well done. The vagina itself should be filled with the small pledgets, until they appear externally. Then you apply a handful or more of dry charpie, and over that three or four compresses, the whole being fixed by a T bandage. If this plug be well applied there can be no hemorrhage. If the charpie at the vulva become moist it is a proof that the plug is badly applied, and it should be removed at once and reapplied. To be of much service the plug should be left in from twelve to twenty-four hours.—*Medical Press and Circular*, April 18, 1875, p. 373.

84.—ON ADHESION OF THE PLACENTA.

By Dr. J. G. SWAYNE, Consulting Physician-Accoucheur to the Bristol General Hospital.

The *diagnosis* of placental adhesion is a matter of considerable uncertainty, unless the hand be introduced into the uterus, so as actually to ascertain by the touch the nature and extent of the adhesion. Before this is done, we can only form probable

conjectures. We may suppose that there is morbid adhesion, if, after the child is born, on placing the hand over the fundus uteri, the uterus can be felt contracting repeatedly and even energetically without any apparent result; and this presumption is strengthened if the cord, on gently pulling it and then letting it go, be observed to spring back as if the placenta were tightly held by the uterus, especially if we can feel that there is no constriction of the circular fibres of the uterus to account for this. It should be borne in mind, however, that the presence of irregular contraction of the uterus is no proof of the non-existence of placental adhesion; for in some of the worst cases these conditions coexist. The introduction of the hand is equally necessary in either case, and soon removes all doubt as to the cause of retention. The existence of hemorrhage proves nothing, as this may accompany retention of the placenta from any cause.

The *treatment* of adherent placenta should be prompt, because this complication is generally accompanied with hemorrhage, which may speedily become dangerous. It is never safe to leave such cases long to the unaided powers of nature, or to rely on ergot, styptics, or any kind of drug. The hand of the accoucheur supplies the only safe and effectual remedy. To employ this remedy properly, some coolness and dexterity and a considerable amount of patience are required. The hand has sometimes to be kept in the uterus for half an hour or more before the operation can be completed. In the ordinary obstetric position, the woman lying on her left side, the left hand will be found to be much the most convenient for this purpose; but, to perform the operation properly, both hands should be used. The right hand applied externally over the fundus uteri steadies the uterus, and gives important help to the other hand during these manipulations. If, in addition to placental adhesion, there should be hour-glass contraction of the uterus, the case is rendered more tedious and difficult; for the circular constriction has first to be overcome before the hand can be passed far enough to separate the adhesions. In such a case, the vagina will probably be found to be loose and capacious, and perhaps filled with clots; whilst the upper portion of it is occupied by a firm fleshy mass, into which the cord is apparently inserted. On making a careful examination, however, by passing up the fingers of the left hand along the cord, which should serve as a guide, this mass is found to be the uterus, tightly contracted around the retained placenta; the circular fibres of the os uteri internum surrounding the cord very closely. This is precisely the condition of things which leads to those horrible blunders which are sometimes committed by ignorant and incompetent practitioners. A practitioner of this sort, for

instance, having waited a reasonable time after the birth of child for the expulsion of the placenta, and finding that this does not take place, and that, moreover, there is some hemorrhage, endeavours to remove the after-birth by tugging at the cord. The only result of this proceeding is, that the cord breaks short off, and the hemorrhage is increased. By the breaking of the cord, he loses his guide; and, becoming still more flurried from observing the fresh hemorrhage, he passes up his hand, and feels nothing but the uterus tightly contracted around the placenta. Mistaking this for the latter, he gets his fingers into the hollow of the sacrum behind it, with the object of scooping out the after-birth, which he supposes to be (what the old nurses call) "grown to the side." At last, by means of his nails, he succeeds in separating the posterior wall of the vagina from its attachment to the uterus, and gets his hand into the pouch of Douglas, and of course, into the peritoneal cavity. Still unaware of his mistake, he grasps the fundus uteri from behind; and, thus obtaining a good purchase, he tears away the entire organ; and then at last, with the appearance of the intestines, the horrible conviction of his blunder dawns upon him.

Such is the manner in which we may reasonably suppose that many of these awful cases of malapraxis take place. I need scarcely remark that such accidents ought to be impossible to any one possessed of the smallest amount of skill and anatomical knowledge.

To pass on, however, to the manipulation necessary in these cases: if the cord be tightly encircled by the os uteri, the constriction should be overcome by insinuating the tips of the fingers into the os in a conical form; whilst the right hand all this time is making counter-pressure upon the fundus uteri, so as to steady that organ. Should these precautions be neglected, the connections between the vagina and the uterus may be put very injuriously on the stretch, especially if the circular fibres of the os oppose much resistance to the introduction of the hand. As the tips of the fingers pass through the os, they should be gradually expanded and separated from one another, until, by sheer fatigue, they overcome the contraction of the uterine fibres, so as to allow the passage of the entire hand into the uterus. When this is accomplished, the next step is to pass up the hand sufficiently high to reach the placenta. The distance which it has to pass before this can be felt will depend very much upon the position of the placenta and the degree of contraction of the uterus. If the placenta be attached, as it usually is, to the fundus uteri, or if the uterus be in a flaccid condition, it will be necessary to pass the hand much further than when the placenta is attached lower down, or when the

uterus is well contracted. I have sometimes had to pass the hand quite into the epigastric region in search of a retained placenta. As soon as the placenta is arrived at, the fingers should be spread out, taking care not to entangle them in the membranes, until the circumference of the placenta can be felt. If any portion of the circumference be already detached, the tips of the fingers should be cautiously inserted between this portion and the inner surface of the uterus, and the placenta gradually peeled off. All this time, the right hand, externally applied, steadies the portion of the uterus from which the left hand is detaching the placenta, and enables the accoucheur to estimate the exact thickness of the uterine walls included between the hands, so that he can avoid digging his nails into the substance of the uterus. There is sometimes considerable danger of such an accident when the adhesions are very firm and close. There is also considerable danger of leaving portions of placenta behind: a risk that one can readily comprehend in such cases as those described by Dr. Ramsbotham, who states: "I have opened more than one body where a part was left adherent to the uterus, and where, on making a longitudinal section of the organs, and examining the cut edges, I could not determine the boundary line between the uterus and the placenta, so intimate an union had taken place between them." In all such difficult cases, it will be necessary to sever the adhesions by using the finger-nails with a kind of sawing motion from side to side. The tips of the fingers are placed in a line like the edge of a saw, keeping the palm towards the placenta and the knuckles towards the uterus, and the sawing motion is continued very slowly and gradually, until the entire placenta is separated and falls into the hollow of the hand. This proceeding sometimes requires a great deal of patience, and is exceedingly tiring; but the accoucheur should take his time about it, working with both hands, and making his ground sure as he goes on, and not withdrawing his hand with the placenta until he is certain that he has brought away every part of it that can be safely separated. It is very seldom, comparatively, that the adhesions are so firm that this cannot be done. Should this, however, be the case, we have a choice of evils: either to run the risk of causing secondary hemorrhage and septicæmia by leaving portions behind, or of causing metritis from injury to the uterus in bringing them away. For my own part, I think that the last of these two courses is the least dangerous, except in very unusual cases. I have notes of only two instances in which it was necessary to leave any portion of consequence behind. Fortunately, in both, the pieces were expelled on the third day, without having caused any untoward symptoms, although in one the piece expelled was as

large as a hen's egg. Of course, in all such instances, the dangers of septicæmia should be guarded against as much as possible by the frequent use of vaginal injections containing Condly's or other disinfectant fluids.—*British Medical Journal*, June 19, 1875, p. 802.

85.—ON AUTOGENETIC CASES OF PUERPERAL FEVER.

By Dr. ROBERT BARNES, London.

[The following remarks were made by Dr. Barnes during a discussion at the Obstetrical Society of London, on the subject of puerperal fever.]

These cases are as distinct in their origin as many cases of infection. For example, you see a woman in the country away from all sources of infection; a little bit of the placenta is retained, a clot of blood is there, or some change takes place in the uterus, and there is an element of infection; it runs along the veins or the lymphatics, is absorbed by the mucous membrane; then you get the blood tainted, and the slightest matter will set it going; the whole system is in a ferment, just as it was from the poison of scarlet fever or typhoid; you may call it pyæmia or septicæmia, the result is about the same. These cases come on a little later than those which have a zymotic origin, and they can often be arrested by washing out the uterus, and bringing away any superfluous matter there. Many women will succumb at once or rapidly to a single dose, no matter how small it may be, but others can resist to a certain extent; their excretory organs may be in good working order, and they may throw off a moderate dose or two moderate doses; but they cannot survive repeated doses. If you can wash out the uterus, you may prevent the renewal of the poison, and stop the disease. That principle has recently come into vogue again. It was practised and taught with success by Harvey, who, if he had not been the greatest of physiologists, would have been perhaps recognised as the foremost obstetrician in the world. This mode of infection is one of very great importance for us to consider. There was a case referred to by Dr. Huntley, who believed that infection was taken into the medical attendant's system, and might be given off by the skin. I believe it may be propagated by the breath of a medical attendant or a nurse. We must all be conscious sometimes of taking in poisons by coming into contact with poisonous patients. I have gone away from a craniotomy case, where the brain was foul, stinking of it, my breath smelling for a day or two. So with other diseases. So with dysentery, I had shivering, diarrhoea, and foul breath, from the odour of dysenteric stools, for

two or three days after being in contact with a patient of that kind. A man may walk about charged with infectious disease, and those who are susceptible with whom he comes in contact may catch it; those who are not may perhaps have a little dose, which they can throw off, the system being in good working order, and there is an end of it. But a lying-in woman, with the blood ready to ferment, would be readily attacked. There is the secret of the difference. A medical man who has seen a case of scarlet fever comes in contact in the course of the day with twenty or thirty patients, and it is perhaps only the lying-in woman who takes the disease; not that he is necessarily longer with her, but there is a greater liability on her part. I had a letter this morning from the son of an old member of this society—a former vice-president,—who calls my attention to a work by his late father, Dr. Uvedale West. He gives one example which is instructive, and I thought you would like to hear it. He had an outbreak of puerperal fever in his practice; he had to deliver a woman to whom he went straight from a case of erysipelas, and this woman had erysipelas the next day; he went afterwards to another patient, whom he did not examine, and that woman escaped; the next day he went to another case, and the woman died. That is the history of a great many of the epidemics in the German lying-in hospitals, where they have the faculty, as it seems to me, of manufacturing puerperal fever on a large scale. Those women who are lucky enough (we should consider them unfortunate) to be confined in the streets, on their way to the hospital, escape puerperal fever; it is only those who are examined repeatedly that catch it. That has been observed over and over again. If I might be permitted a moment or two longer, I could give you the history of a series of cases occurring in the practice of one midwife in a short time, while all the surrounding neighbourhood was at the time pretty free. I will now sum up my conclusions in reference to the questions submitted by Mr. Spencer Wells. “Did you ever see a case of puerperal fever which is not really a case of scarlatina or rubeola, or erysipelas or traumatic fever caused by the bruising or tearing of parts?” I do not think there is any fever caused simply by bruising the parts. If there is a little scratch, no matter how small, and the poison is conveyed to it, that is a different case. It is not necessary to suppose that there is a puerperal fever which runs a definite course like scarlet fever. We get a fever which is fatal, and that is serious enough to be considered as a case of puerperal fever. As to the question whether there is a real form of puerperal fever which is not scarlatina or any of the conditions specified, I will say that there is, and I have called it excretory puerperal fever. We have albuminuria at the end of

pregnancy, and those cases are extremely apt to go into puerperal fever. The blood is peculiarly overcharged, the liver and kidneys cannot act, excretion is at an end, and then the poison runs riot without any ingestion of poisonous matter from without. That is pure puerperal fever which the patient herself can generate. Then, as to how the spread of the disease can be prevented. I can only say by careful isolation of the patient. The conditions of practice are sometimes incompatible with that. There was a case mentioned by Dr. Uvedale West. He was on the point of going away, and there was no one to take his place. The patient sent for him, would have him, and she fell a victim. That may happen to any one in the country. He cannot get away when he likes. With regard to the question of bacteria, as I know nothing about it, I had better say nothing; but I may reserve my doubt with Dr. Richardson, and wait till the bacteria doctrine is proved by those who understand it. With regard to the value of antiseptics in order to keep hospitals free, I think that to keep hospitals free from puerperal fever is an extremely difficult matter—more difficult than it is in a surgical hospital to keep it free from pyæmia. You cannot keep a series of patients in a hospital isolated, in the proper sense of the word. You have the same nurses going to them; you have a variety of influences acting upon one or two patients, and the consequences may be radiated to others. There is only one secret for safety, and that is to have the woman confined at her own house, where she can have her own nurse, who has not been in the way of infection, and her own medical attendant. Then the chances are that she will go on favourably and happily. Without that there is no security. A lying-in hospital is not now by any means so serious a danger as it used to be; still it is always like a volcano, which may explode at any moment.—*Lancet*, May 15, 1875, p. 687.

86.—ON THE INFECTION OF PUERPERAL FEVER.

By Dr. SWAYNE, of Clifton.

As to the mode in which the infection of puerperal fever is conveyed, I think it is generally conveyed by the person of the accoucheur more than by the clothes or any other way. Some men are peculiarly unfortunate in this respect. It is often observed that all the puerperal cases in a district are limited to a few practitioners. It is not only that they have the run of them at a particular time, but even after a long interval it is the same men who get them. Some men, I believe, have the power of absorbing and exhaling these poisons to a much greater extent than others; and from remarks I have made in my own experience, I am inclined to think that the poison is

much more likely to be given off by the skin than by the breath of the practitioner. I have come to the conclusion that men who have very moist, perspirable skins, especially moist hands, are much more likely to exhale it than those whose hands are generally dry and cool, especially if they have to make frequent examinations during labour. With regard to the precautions to be taken to prevent the spread of puerperal fever, I cannot think that it is necessary for a medical man to exclude himself for more than a week at the outside from midwifery practice. If he is unfortunate enough to have a bad case, probably by that time the poison will have passed out of the system. He should also take the precaution of not wearing the same clothes. I am not aware of having conveyed anything of a puerperal kind to a patient except once. That was in a case of scarlet fever. As a general rule I now refuse to go to a case of scarlet fever, unless of course it should occur to a lying-in-woman. I refuse to see children with scarlet fever on account of the danger of conveying it. Some years ago I did not do so. I was attending a child with scarlet fever, and I attended a lady at the same time. About a week afterwards the rash came out, with sore-throat; she did perfectly well, and did not show any symptoms of puerperal fever. But the worst case of scarlet fever I ever saw was in a lady who, about a week before her confinement, called at a house where the fever was; the children were ill, and she was afraid to go in; but most imprudently the mother came out directly from the sick room to report how they were going on, and she put her head into the carriage to talk to this lady. In that case the scarlet fever came on *pari passu* with the labour. I attended her about 10 o'clock at night. I observed that her face became red, and at the latter part of the labour the speech was rather muffled. The redness of the face did not excite particular attention, as it generally comes on at the second stage of labour. On the next day I found she had been delirious; she was covered with a thick rash, had a sore throat, and died in two days. Immediately after seeing a case of puerperal fever I go home, and before going to bed take a warm bath and wash myself with carbolic soap; and on the next day I take a Turkish bath, which I think is an excellent way of eliminating the poison and cleansing the skin. I need hardly say that, with every accoucheur personal cleanliness is of the greatest possible importance. We know that cleanliness is next to godliness. We cannot be too particular about it, especially after seeing cases of this kind; and we should be very careful not to wear the same clothes. With these precautions in a very few days there will be little or no danger of conveying the poison from one patient to another.—*Lancet*, May 15, 1875, p. 690.

87.—ON THE INFECTION OF PUERPERAL FEVER, OR
PUERPERAL PYÆMIA.

By Dr. GRAILY HEWITT.

The opinion which I have formed with respect to puerperal fever is that it is essentially a form of blood-poison. Some seven or eight years ago I read a paper before this Society in which I detailed the experience which had occurred to me in the British Lying-in Hospital with which I had been connected for some time. I brought forward a considerable number of cases, and in giving my conclusion in reference to the nature of the malady, I expressed myself in these words:—"It is impossible to escape the conclusion that puerperal fever consists in nothing more nor less than an injection into the general circulating fluid of a poisonous material of animal origin; that it is a form of pyæmia for the production of which the minutest portion of the morbid agent may prove sufficient." I was very early impressed with a lecture published by the late lamented Sir James Simpson, of Edinburgh, I think about 1859, in which he strongly advocated the doctrine that puerperal fever is a form of pyæmia; and what I had seen at that time, and what I have seen since, has certainly led me to endorse that view of the matter in the strongest manner possible. I may say that I entirely disbelieve in the existence of a form of fever which is sufficiently definite and precise to receive a distinctive name, in the same sense that we speak of typhus fever, or typhoid fever, or measles, or scarlet fever, or small-pox, each of which has a definite and well-determined course. I can see nothing in puerperal fever which at all resembles this. I think all the clinical evidence producible on the subject is entirely opposed to that view, and therefore I have no hesitation in answering that part of the question put by Mr. Spencer Wells in the way I have done. I think it would be profitable to divide the cases of puerperal fever, or puerperal pyæmia, into two classes. There are the cases in which there is very distinct evidence of the introduction into the system from without of a morbid animal poison; there are, in the second place, cases which do not resemble these, in which the evidence is wanting of the introduction from without of such a morbid poison; and I will endeavour to make my remarks under those two heads. In the first place, in reference to the cases that occur from the introduction of poison from without, after what has been said on this occasion and on former occasions, there can be no question that it has over and over again happened that the disease called puerperal fever has been produced by inoculation (the word seems to me to be suitable) in those unfortunate cases where the medical man himself conveys the disease, and in those cases where the midwives are equally efficacious in communicating

it. It is to that class of cases that I would first call attention. It is my impression, from all that I have seen, that the manner in which this communication takes place is, in a large proportion of cases, by means of the hand, and I believe that the spaces beneath the nails, and under the skin which cover the nails, are exceedingly liable to harbour these animal destructive products; I do not say that they are limited to those parts; the skin of the fingers may also be their habitat. We know what sometimes takes place after a post-mortem examination, when it is exceedingly difficult to get rid of the smell of the corpse from the hands, cleanse them in whatever way you will. I am speaking now more particularly of what happened some years ago, before carbolic acid and other disinfectants were much known or used. It is not so difficult now as it was. At all events, I believe that the nails and the neighbourhood of the nails are the parts more particularly liable to harbour these infecting materials. It seems to me rather unlikely that the clothes carry infection so readily. Of course, where a person allows the cuffs of his coat to be dipped in putrescent material, and then makes an examination of a patient in childbirth, something may happen after that. On the whole, I think the hand is particularly efficacious in this matter. I share the opinion that some previous speakers have expressed, that very great attention should be bestowed on cleansing the hands in all cases where they are to be used in midwifery practice. A good deal has been said of late years in reference to the armamentaria that medical men should be provided with; and I think a useful addition would be a pot of carbolic ointment and a nail-brush. In the next place I would remark that it has seemed to me that any animal poison introduced from without may produce what we term puerperal pyæmia, the same as may be produced by a student who is handling surgical wounds in the hospital and attending midwifery cases. I have instances of this in the case of a medical practitioner going from one puerperal case to another. I see no difference in the attack produced in these two different ways: there is nothing whatever different in regard to the clinical features of them. Another mode in which the poison is introduced from without is due to carelessness in washing the patient or an improper method of washing. I think water ought never to be used for cleansing the perineum in the case of a recently delivered woman; I think it is far preferable to use a dry clean rag or dry cotton-wool. This plan secures greater immunity from the passage of the débris from without. Then there is another method by which poison may be introduced from without—that is, in the case of laceration of the perineum; I think this mode of introduction is not very uncommon. I recollect being

called into consultation to see a lady who was suffering from puerperal pyæmia. Very great care had been taken with her to keep her exceedingly quiet, and she had not been allowed to be moved from her position (lying on the back) for some days after labour. The perineum had been slightly torn. Now in this case the discharges were putrescent. It seems hardly possible to escape the conclusion that in such cases as this there is a pool of putrescent material in the vagina constantly in contact with the abraded perineal surfaces. Is it to be wondered at if some of this is absorbed? I think it is bad practice in all cases to maintain the patient too persistently in this position on the back. I think there is an advantage in turning her from side to side occasionally, in order to allow of the escape of putrescent débris from the vagina. Not that it will produce pyæmia in all cases, but if there is a laceration of the perineum it is more likely to do so. So far for the cases which come under the first category. I will now proceed to discuss those which are more difficult to define and particularise—those on which the affection does not apparently depend upon anything introduced from without. This class corresponds to the cases denominated by Dr. Barnes “autogenetic.” In the first place I would remark that it is exceedingly easy to produce pyæmia in the non-puerperal woman by handling the uterus in a certain way. I have seen acute pyæmia produced by the action of a sponge tent at the os uteri, left in too long, and producing violent inflammatory symptoms, and death in a few days. It is well known that this event may happen; the uterus is so constructed that it is exceedingly easy for pyæmia to occur in it and in its tissues: the walls are very thick, the vessels are very large, they communicate very freely (I am now speaking of the uterus in the non-puerperal state), and a slight wound may at any moment set up pyæmia. I have always been unable to see any precise difference between an attack of pyæmia in a puerperal state and a non-puerperal state; the symptoms are precisely identical, they only differ in degree. I do not wish to give my remarks the semblance of a lecture, but I thought it might be interesting to bring a specimen (which I have done) representing the healthy uterus immediately after delivery, in order to show the condition of the organ at that moment. I have also brought with me a plate by a celebrated embryologist, exhibiting the condition of the uterus after delivery. Doubtless a great many teachers of midwifery are familiar with it. It will serve as a peg on which to hang the remarks to which I shall call your attention in the next place. In the uterus after delivery we have an organ precisely analogous to a sponge; it has large interstices, large spaces freely communicating, and, moreover, these spaces open into the uterus through the vessels

which have communicated with the placenta, and these openings are filled up by certain clots. The natural event after labour of course is that the uterus becomes contracted, and a progressive diminution occurs in its size. This is the safeguard, and this is the important vital phenomenon which belongs to the after-period of childbirth. Now it is my belief and conviction from all I have seen, that if we wish to obtain a clue to the manner in which puerperal pyæmia is produced, we must regard this process very attentively, and notice particularly the deviations from the normal physiological process which are so liable to occur. It is some years now since my attention was first directed to the fact, but it is a fact which I have been able to confirm by repeated observation since, and which I deem to be of the greatest importance in reference to this matter—that concurrently with the commencement of the attack of puerperal pyæmia the uterus is found to be enlarged; in other words, in a state in which its involution is absolutely retarded. I have never seen a case of puerperal pyæmia in which this condition of the uterus was absent, and absent at the very commencement of the malady. It seems to me, if this is a fact, that it is an exceedingly important element in the explanation of cases of puerperal pyæmia, of whatever kind they may be. It has seemed to me, in endeavouring to carry out explanations of these cases, that the thing which fails is the contraction of the uterus. That is where the break-down originally occurs. The woman has a large bleeding, for instance, at the time of childbirth. The want of contraction in the uterus acts in precisely the same way as if all the locks of a house were taken off, and ingress allowed to any burglar who wished to enter the premises. This is precisely what happens, in fact, after a labour; the contractile power of the uterus fails to a certain extent, the expulsion of the débris ceases, and there occurs a suction action in the uterus by which the débris are taken up into the circulation. I explain those cases in which the scarlet fever poisons and other fever poisons apparently produce disease in this way: they destroy the vitality of the patient to a certain extent, they take away the safeguard, they abolish the contraction of the uterus, and they produce a paralysis of the uterus for the time being, and having once produced this paralysis the rest of the explanation is sufficiently simple. The pyæmic process immediately passes into the uterine sinuses, and it is a question whether the patient will survive, or whether the injuries in this manner will end in speedy death. — *Lancet*, May 15, 1875, p. 690.

88.—TWO CASES OF INOCULATION WITH THE SEPTIC LOCHIA OF PUERPERAL WOMEN.

By Dr. WILLIAM STEWART, Barnsley.

The elucidation of the nature of the poison and the etiology of puerperal septicæmia, is of such vital importance, and, at the present time, occupies such a prominent place in the mind of the profession, that I feel no apology is required from me for bringing under the notice of the profession the two following cases.

Case 1.—Miss G., aged 52, a delicate woman, frequently suffering from hepatic derangement, and the subject of an obscure internal abdominal tumour, said to have followed an injury from a railway accident, called me to see her on Sunday, October 8th, 1871. I found her suffering from most excruciating pain in the right forefinger. The pain was so agonising that I was led to inquire whether she had not scratched or injured it in any manner, when she informed me she had very slightly scratched that finger and the one next to it a few days previously. Upon remarking further that I was afraid she had received some poisonous matter into the scratch, she then remembered having given an injection to a lying-in woman on the evening of the 6th (about thirty-six hours before my visit), whose nurse was very inexperienced, and had neglected to change the patient for several days after delivery. I was informed by the medical gentleman in attendance upon the confinement, that his patient had peritonitis at the time. My patient had wrapped a piece of adhesive plaister round the middle finger, which was therefore quite unaffected, but unfortunately had left the scratch on the forefinger totally unprotected. Here, then, was the clue to the case, decomposing lochial discharge applied to the recent scratch. This case ran a most acute and rapid course. Thirty-six hours after the application of the septic matter, I saw the patient. The finger was then hard and indurated, but not much swollen. The back of the hand was very red and much enlarged. The inflamed lymphatics in red streaks could be seen passing up the forearm; and in twelve hours more, in spite of all measures adopted to arrest the advancing disease, the finger had mortified. The next day, her relatives being very anxious, I met in consultation two neighbouring medical gentlemen, who agreed with me as to the cause of her symptoms; but the gangrene continuing to spread soon involved the other fingers, hand and wrist, and was followed by a fatal termination on the 10th, being ninety hours from the application of the poison, and about forty-eight hours from the time when I first saw the case. Throughout the short course of her illness, the

general symptoms were those of high fever, persistent vomiting, and, towards the close, delirium.

Case 2.—The poison in this case was introduced from a puerperal patient in my own practice. Mrs. L., a primipara, was delivered by Dr. Heath, my assistant, on October 24th, 1874. Three days afterwards, symptoms of acute peritonitis set in, preceded by decomposition of the lochia and accompanied by profuse diarrhoea, and other symptoms of blood-poisoning. Injections of Condyl's fluid into the uterus and vagina were used to disinfect the discharge. These were administered by Mrs. M. (her mother), who, on November 5th, two days before her daughter's death, had inflicted a slight wound with a table-knife over the first joint of her left thumb. The wound being slight, she did not consider it necessary to mention it, or to apply any dressing to the part, but continued to administer the injections without any protection to the thumb. On the 7th, I found her suffering from most violent pain in the thumb, which was swollen and indurated; the wound was gaping and sloughy in appearance, the back of the hand red, shining, and erysipelatous. A free incision on the thumb above the wound, followed in a few days by another on the back of the hand, gave exit to a large quantity of pus, and relieved to a certain extent the severity of the symptoms; but the purulent affection seemed to travel along the cellular tissue of the forearm, which in turn had to be relieved by incision. The lymphatics were inflamed as high as the elbow, where there was a patch of erysipelas. This case terminated favourably in six weeks, leaving only the first joint of the thumb stiff.

These cases appear to me to be specially instructive; first, because of the danger to which attendants are exposed when it becomes necessary to give vaginal injections to puerperal patients. And I think it becomes the duty of the medical attendant to warn the nurses to take precautions not to allow the discharge to come into contact with any recent wound or abrasion of skin. Secondly, they are exceedingly interesting from their tendency to throw light upon the nature and production of puerperal septicæmia, as they show that the application of decomposing lochia alone to a recent scratch or wound has been sufficient of itself to produce gangrene of the part and death of the patient in the one case, and a very severe attack of phlegmonous erysipelas in the other, although no puerperal condition existed in either of the inoculated subjects. I think we may, therefore, draw the conclusion, that the passage of decomposing lochia over any abraded surface in the vaginal passage is sufficient to produce puerperal septicæmia without the importation of any other specific poison. In this manner, we may account for the disease attacking much more

frequently primiparous cases, as the vagina and perinæum are much more likely to be slightly lacerated in those than in multiparæ. If it were possible to apply as effectually the antiseptic treatment to these cases as it is carried out by Professor Lister in surgical cases, I have little doubt that as good results would be obtained. Obstetricians too frequently begin to lock the door when the horse is stolen; we wait until there is evidence of decomposition having already taken place in the lochia before steps are taken to prevent or counteract the danger. Cannot some antiseptic means be devised to be used from the time of delivery? I should be inclined to think that folds of antiseptic gauze, instead of the ordinary napkin, and an antiseptic lotion for detergent purposes, would be of very great service, and might prove quite sufficient to prevent the setting in of putrefactive change in the discharge.—*British Medical Journal*, April 17, 1875, p. 503.

89.—ON PUERPERAL PYÆMIA.

By Dr. J. THORBURN, Lecturer on Obstetrics and Gynæcology,
Owens College School of Medicine; Obstetric Physician,
Manchester Royal Infirmary.

[Dr. Thorburn states that the following are the principles which he has taught, believed, and acted upon.]

1. The puerperal woman is placed much in the same position as one who has undergone a serious surgical operation involving raw absorbing surfaces, together with, not unfrequently, a sudden depression of the vital powers.

2. In virtue of this, she is specially liable to the attacks of infectious disease, and, when attacked, to sink rapidly under their influence.

3. She is also most liable to every form of pyæmia and septicæmia.

4. When attacked by these latter, she is subject, in many instances, to a group of fatal symptoms, which has, for convenience sake, been termed puerperal fever.

5. This fatal group of symptoms, however induced, has a remarkable tendency to be conveyed to other parturient women in an almost indential form.

6. The mere theoretical question as to what we should call this group of symptoms has no bearing on the practical question. What must be done to prevent its propagation to other parturient women?

7. It is, therefore, the duty of every practitioner to avoid, as far as possible, any communication of the effluvia, secretions, or emanations of fever, erysipelas, pyæmia, unhealthy sores, or the like, to his obstetric patients.

8. This implies that he shall use all the precautions which modern science or his own knowledge recommend, such as the use of antiseptics, change of clothing, selection of time for visiting, and the like; but cannot possibly imply, in the present state of society, that no general practitioner shall, with proper care, visit simultaneously any cases of infectious disease and cases of confinement.

9. One of the most important precautions, however, is to abandon for a time the practice of midwifery whenever the practitioner is compelled (using Dr. Duncan's own word) to nurse a case of scarlatina, &c. By nursing, I mean to very frequently visit, stay with, or handle as a nurse does: the only means of saving many cases of fever.

10. When a group of symptoms, probably due to septicæmia or approximating to that popularly termed puerperal fever, has occurred to a practitioner, he should redouble the usual precautions; and, if he meet shortly with a second case in his own practice, he is morally bound—I suspect legally also—to abstain from midwifery practice for some weeks. If Dr. Duncan could by statistics, of which he is so great a master, and which seem invariably to obey his command, determine the exact time of necessary quarantine, he would confer the greatest possible obligation, in more senses than one, upon the medical profession.

11. A professed obstetrician should not indulge in *post mortem* examinations, or other probable sources of septicæmia.

12. Midwives who, like Mrs. Marsden, nurse their patients from the commencement of labour till convalescence; who administer all enemata and vaginal injections, and who perform all ablutions, are not justified, after they have lost three nearly successive cases, in trying whether a fourth will die, after they have been warned by more than one medical practitioner of the danger incurred.

These principles of action, roughly sketched, I have ever taught in this school of medicine.—*British Medical Journal*, June 12, 1875, p. 793.

90.—ON PUERPERAL FEVER.

By Dr. HENRY SAVAGE, Consulting Physician to the Samaritan Free Hospital.

The lymphatics have been shown by Leopold to be very numerous in the mucous membrane of the uterus. The surface is highly absorbent, and the small vessels of the uterus are invaginated in these lymphatics. It is a very curious arrangement shown in Leopold's book. I fancy I have seen them. I

do not say anything as to the microscope, since I find a power of fifty talked of, whereas I found a power of twelve difficult to manage. It seems to me then that, as a matter of demonstration, we have brought it down to this—that we have seen the septic matter, we have touched it, and smelt it; have mentioned experiments in regard to the composition of it; and we now can have no difficulty in believing that some septic stuff will accumulate in the interior of the uterus, and get into the circulation, as it did in the case of the peritoneum. Now we come to the difficulty about the fingers, because I said that if I attended a woman in her confinement with my fingers in that state, I had no doubt she would have septicæmia, and I really have no doubt of it. You remember that we had some painful statements from a gentleman in the country who seemed to have had his fingers in that condition, and who lost case after case, and was obliged to give up his practice. I know it is difficult for most of us to comprehend how it is that the mere approximation of a finger should set agoing this curious septic thing. Now every old woman will tell you that if she puts a piece of fetid meat in the cupboard, though it does not touch the rest, all will be turned in the morning. The other day, when passing a butcher's shop in a large district, I found him hard at work with all his men. Having these perplexing questions on my mind, I walked in to hear what sort of disinfectant he used, and he said, "I use no disinfectant; I wash everything with soap and water every night—hooks, cleavers, knives, and everything; then I admit the meat. If I did not, it would all be turned towards the morning." I do not myself profess to understand or explain how it is that the approximation of bad meat to good will turn the good to bad, but so it is; and we can apply that fact, though I have no explanation of it, to show how contact with a fetid finger would lead to septicæmia in a woman.—*Lancet*, June 12, 1875, p. 828.

91.—ON PUERPERAL FEVER.

By Dr. W. WILLIAMS.

I have never met with a case of so-called puerperal fever existing as a disease *per se*. I have seen many cases of disease described as puerperal fever, with all the characteristics, which I have been invariably able to trace to a cause easily recognisable and capable in most cases of being recognised early enough for removal; and, as a matter of course, I do not believe that the disease is due to any special morbid poison. In answer to the second question, I am also decidedly of opinion that puerperal fever cannot be referred to any special disease, although the existing cause of puerperal disease may arise during the

progress of any one of the diseases alluded to, and many others—that is, should they happen to be accompanied by any gangrenous or suppurating wound. Women are often confined with the diseases mentioned in the same room with them, and derive no injurious effects therefrom. Again, puerperal women exposed to those diseases, and who have not been previously attacked with them, will take them as other persons without any special action on the uterine organs. I could relate numerous instances proving both these statements did time permit. I shall consider the third, fourth, and sixth questions together; the one is so intimately connected with the others. I have stated what I believe the disease not to be; I will now state what I believe it is. Every case of so-called puerperal fever—I do not mean peritonitis and such like—is due to septicæmia, to septic contamination of the blood; and its injurious effects are first and most severely recognised in the wearied and bruised uterine organs and surrounding parts. The disease is then purely septicæmic. I agree in the main, on this head, with what fell from Dr. Graily Hewitt, with the exception of his terming the disease pyæmia. It is not pyæmia, and I consider that the calling of it so has led to much of the erroneous doctrines that have been promulgated. For instance, a female, three or four days after her confinement, is taken with what is termed puerperal fever, and rapidly sinks in a few hours. It is said she has died of pyæmia. A post-mortem is made, and no pus is found, only a quantity of bloody sanious serum, with a peculiarly sickening and offensive odour. This is poisonous matter. If the patient had not been prepared, as it were, by the powerful dose of septic poison in her system, and had possessed sufficient strength and vitality to form pus, she would have had a far better chance of recovery. I look on the formation of pus as a healthy effort of nature to surround and isolate the irritating poison. In fact, I do not believe that pus—laudable pus, as it used to be called,—whether in or out of the circulation, ever killed any one. It is only injurious when it becomes putrid. I believe that putrid animal matter acts injuriously on the puerperal female in two ways, and that the symptoms both vary in intensity and character. In both instances the septic poison enters the system, but in a different form, and as in the one case the poison is much more concentrated than in the other, so its effects are more overpowering and rapid. In the case of most intensity the poison enters the system in a state of solution; in the more chronic cases it enters as vapour. In the first case there is a breach of surface, generally in the vagina; in the other there is no breach of surface. When there is a breach of surface the septic poison comes immediately in contact with the fresh wound, and a dose sufficient to knock the patient down at

once is taken into the circulation. In the other case a mass of putrid matter, it may be decomposing blood, is pent up in the uterus or vagina, and penetrates the mucous membranes and deeper tissues more slowly; in fact, it is a case of continuous poisoning. This form frequently terminates in puerperal mania. There is no such disease as puerperal fever; it is nothing more nor less than septicæmia, and is always due to the presence of putrid animal matter. Now this putrefaction may be caused in three ways: (1) by retention of portions of the placenta or blood-clots long enough for them to undergo decomposition; (2) by the bruising and sloughing of vaginal mucous membrane; and (3) where the septic poison is conveyed to the discharges of the patient, and by its presence sets up rapid putrefaction in the lochia, so rapid that when once the fermentation is set up the whole of the lochia appear to become putrid at once, like the action of yeast, or wort, or dough. The first is to be prevented by not leaving any portion of the placenta or of blood-clot (as far as practicable) in the uterus or vagina. It must not be overlooked that certain conditions of the atmosphere also tend very materially to promote this putrefactive fermentation. This has been described by Sir J. Paget, who has pointed out that at times the wounds of patients, not only in hospital, but outside, take on an unhealthy character, and become gangrenous. Of course, should any portion of placenta or blood-clot be present, your first care will be to remove them, and wash out the vagina, and, when necessary, the cavity of the uterus with some antiseptic fluid. You must not be satisfied with telling the nurse to do it, you must see her do it, or (as I generally do) do it yourself the first time. The treatment of the second form, when you have a slough, is the same—to syringe out frequently with some antiseptic fluid. To prevent the third cause every care must be taken to prevent any septic or putrid poison from coming in contact with the lochia. I have not time to point out how this may be best attained, neither is it necessary, as you have already heard all that can be said on the subject as to isolation, ventilation, and the like. No method, however, has been pointed out, or even alluded to, in the course of the discussion by which the septic poison could be got rid of should it have attached itself in any way to the body or dress of the accoucheur or nurse. We have more than one substance—one in particular—that will not tolerate the presence of putrid animal matter or septic poison; this drug is iodine, which as soon as it is brought into contact with septic matter, is converted into two harmless substances. Let any medical practitioner who has been in attendance on any case, whether a parturient female or any other, where there happens to be putrid emanation, wash his hands in water

into which he has poured tincture of iodine, and I will answer for it he has no septic matter under his finger-nails. Again, if he fancies that his clothes, hair, and skin are saturated with it, let him go into the watercloset (I mention that as the smallest room in the house), place a few scales of iodine on a plate and put a spirit-lamp under it, and he will soon find himself surrounded by a violet vapour which will fall upon him in a shower of minute scales, from which he has only to protect his eyes. If he then carries with him any of the puerperal poison, my whole theory of the disease must be wrong. One thing I can assert, that in my own practice I have never had a case of fatal puerperal septicæmia since I have used iodine as an antiseptic, now more than twenty years ago. Iodine is equally efficacious in warding off septicæmia in other surgical diseases. I have injected solutions of septic poison under the skin of guinea-pigs, and produced death by septicæmia; I have also injected some of the same solutions, into which I had dropped a few drops of tincture of iodine, without producing any ill effects. It is needless to observe that the prevention and the cure of this disease go hand-in-hand together. Should any septic poison be present in the puerperal woman, wash her out again and again with solution of iodine until the solution comes back the same colour as it was thrown up. The temperature of the patient will probably be 103° or 104° , and it will go down in a very short time to 98° . This I have witnessed since the present discussion began. The fifth question is as to bacteria—a delusion and a snare! It is possible that the septic poison may be conveyed by them or by any other substance floating in the air that is called harmless; that is all the harm they can do, as I take it. They live on this putrid matter as mites and maggots do on cheese, or vibrios on decayed potatoes during an epidemic of potato disease. In fact, I am inclined to think that they are present for the purpose of removing the poison, not generating it.—*Lancet*, June 12, 1875, p. 828.

92.—PUERPERAL INFECTION.

By Dr. JOHN CARRICK MURRAY, Newcastle-on-Tyne.

[The late Dr. Dawson, Lecturer on Midwifery, Newcastle-on-Tyne, recommended the following plan to Dr. Murray, for preventing run of puerperal fever in his practice. They had been together to see a case of puerperal peritonitis.]

Touch this poor woman with one hand only, and reserve the other for future cases; and, lest you should inadvertently neglect the precaution, you might put the mistrusted hand in a sling when called to a case. I warmly thanked the doctor,

felt my weight of anxiety removed, nor have I ever had more than isolated cases of puerperal fever since. Before parting, I told Dr. Dawson that I had more than once observed my revered teacher, the late Dr. Patterson of Glasgow, with one arm in a sling, he must have adopted the same method. Undoubtedly, was the reply. Dr. Dawson's mode of preventing the spread of "childbed fever" would also be efficacious in cases of syphilitic infection. Had it been more in vogue, we might never have had to lament that distressing trial of Simpson and Wife *v.* Davey. That "puerperal fever" is infectious is quite granted in this district, for I have heard it styled "nail fever."—*British Medical Journal*, May 8, 1875, p. 609.

93.—ERYSIPELAS AND PUERPERAL FEVER.

By S. N. SQUIRE, Esq., Wivenhoe.

In Mr. T. Spencer Well's recent address on puerperal fever, the following sentence occurs: "A country surgeon attends a man who has erysipelas after a broken arm. He also attends a healthy woman in an isolated cottage in a natural labour. There is no puerperal fever in the district, yet this woman dies of puerperal fever. . . . Such a history as this would have tenfold weight, as being free from numerous sources of fallacy and doubt."

On the night of February 11th last, my assistant went to attend a man who had fallen down and cut his head open over the occiput down to the bone. The wound was about an inch long. On the second night, it bled, evidently from a small artery, which he arrested by a compress of lint. On the 20th, the man was taken very ill. I myself went to see him, and found that he had been suffering from rigors. I examined the wound; the scalp was somewhat swollen. I carefully washed and dressed the part. The same evening, I was called to attend a woman in confinement (age about 37, fifth child), who had a natural labour. The next day I found that the man was suffering from erysipelas; it was running down over the forehead. On the 22nd, the woman had a chill, with all the symptoms of puerperal fever setting in. She died on the 27th; the man likewise died on March 1st. I took every precaution whilst attending other cases, and did not wear the same external clothing; so I did not infect any other lying-in woman. Early on March 3rd, I attended another woman (age 22, second confinement) who, on the day following, had all the symptoms of the previous case. I questioned the nurse, as she came from the village where the man died, whether she had been in the house. She informed me she had been there to assist, and left

that place direct to go to the woman in labour. That case terminated fatally on the 10th. The child had erysipelas at the navel, which spread all over the body; it died on the 18th. A nurse, who was in almost constant attendance upon the man, had an abrasion on the nose; she had erysipelas on March 3rd, and died on the 7th. Whilst attending the man, I was also daily dressing two women, each for an ulcerated leg; both had erysipelatous inflammation of the leg. The husband of one, an old man, aged about 78, had erysipelas over the head and face, from which he got better, but died of exhaustion on May 6th. A son of the old man's master called to see him on April 25th; he had a slight scratch on the septum of the nose. On the 27th, erysipelas made its appearance, and spread over the face, from which he has now recovered.

To go back again to the first case. On March 13th, a woman, who had been several times to see the man (whose house was directly opposite her own) had a severe attack of erysipelas over the head and face; she recovered. A young woman likewise visited her, and at the same time had her ears pierced for rings; erysipelas affected them, and spread rapidly over the head and face; she recovered after a severe attack. During the interval of the two puerperal cases, I attended other women, who escaped infection. Thus, I had nine cases of erysipelas and two of puerperal fever, with six deaths, all to be traced from the first. In looking over my midwifery list, I find I had previously attended 1,139 cases without losing one. I have been in practice twenty-five years, and, during that time, I have only lost four cases, not including the last two I have previously mentioned. One died of inflammation of the lungs, three days after confinement; another (a turning case) of peritoneal inflammation, three weeks after confinement; another of scarlet fever; and the fourth of puerperal fever, the cause of which I could not discover. I generally make it my practice, if I have any contagious disease about, to visit my childbed cases first; the doing so, I think, is one reason why my death-rate is so low. Idiopathic erysipelas I consider not contagious; but traumatic, being caused by pyæmia, I think is, and I hold that it would be very unwise to attend a labour directly after visiting such a case. I have had many cases of the former kind, but cannot now remember ever losing one, nor have I seen that another person has taken it from one so affected.—*British Medical Journal*, May 22, 1875, p. 673.

ADDENDA.

94.—THE ANTISEPTIC PROPERTIES OF OILS AND FATTY MATTERS.

By Dr. JOHN DAY, Geelong, Australia.

[The following is a letter addressed to the Chairman of the Central Board of Health of Geelong, and is of considerable interest. We have extracted it from the Melbourne Argus, which was forwarded to us for that purpose.]

“I have for some time past been engaged in studying the chemical properties of fats and fatty or expressed oils, and find they all possess the property of spontaneously generating peroxide of hydrogen, a very powerful oxidiser and disinfectant, and of storing it up until they are brought into contact with any of those oxydisable substances for which it has an affinity, such as the products of decaying organic matter, and I have reason to believe, the poisons by which the spreading diseases are propagated; they then part with more or less of their peroxide, according to circumstances, and again begin to reproduce it, and also to store and condense it, unless kept in contact with something which uses it up as fast as it is formed. This process of formation, destruction, and reformation of peroxide of hydrogen in fats and fatty oils, may apparently go on without intermission for an indefinite period, a property which entitles them to rank as permanent disinfectants.

“My object on the present occasion is to draw the attention of the board to the results of an experiment I have recently tried with a view to testing the disinfecting properties of olive oil on urine. I had previously ascertained that the addition of a very small quantity of oil of turpentine to urine would prevent all unpleasant odour for more than a year. On April 1—rather more than two months since—I placed half a gallon of fresh urine in an open vessel, and added to it a very small quantity of olive oil—just sufficient to form a thin film on its surface, so thin that about one-third of the urine has already escaped by evaporation. To-day (June 4), the urine, with the exception of a pretty copious deposit of mucus at the bottom of the vessel, is clear and normal in appearance and perfectly free from any offensive odour; and what strikes me as remarkable is that it has a very acid reaction—so contrary to what might have been expected.

“Now, it has occurred to me that if urine, which under ordinary circumstances so soon acquires an offensive odour and alkaline reaction, can be kept perfectly free from these objectionable changes by simply pouring a little oil on its surface, it is possible that the same practice might be found not only to correct the putrid odour and alkaline reaction which characterise the dejections of typhoid patients, but also to destroy by a process of oxidation the poison by which the disease is propagated. Olive oil would be too expensive for general use, but any cheap vegetable oil would answer the same purpose.

“The plan of using it which I would suggest would be to occasionally pour down the closet in houses where typhoid fever prevails a sufficient quantity of oil to fairly cover the surface of its contents.”

95.—CROTON CHLORAL HYDRATE: ITS MODE OF ADMINISTRATION, THERAPEUTIC EFFECTS AND ACTION.

By Dr. J. C. OGILVIE WILL, Assistant Surgeon Aberdeen Royal Infirmary.

Having for the past twelve months used croton chloral extensively, having found it extremely beneficial in some forms of disease, and believing that it has not received that attention from the members of the medical profession which the success of chloral hydrate would have naturally been expected to ensure for it, and which it also—standing on its own merits—most certainly deserves, I am anxious to lay before them the particulars of a few of the cases in which I have employed it, in the hope that they may consider them sufficiently successful to warrant their according it a trial.

Before doing so I may explain the composition of the preparation of croton chloral which I now generally prescribe. Messrs. Reid and Son, chemists in this city, made a very nice syrup for me containing two grains of croton chloral to a drachm of a mixture of glycerine and syrup of orange flowers, coloured by adding a very minute quantity of tincture of cochineal. This effectually conceals the taste of the drug, which is certainly to be desired, as it seems to me decidedly unpleasant, and when taken without some flavouring agent it leaves a disagreeable, semi-acid taste in the mouth for a considerable period after swallowing it. This preparation is permanent, a matter of considerable moment, as croton chloral, though rather freely soluble in warm fluids, is only sparingly so in cold, and when first employing it I was disappointed to find that a mixture which was perfectly clear when first made, soon after became clouded, and threw down a copious deposit

of crystals on becoming quite cold. It is, as stated by Wallich and Diehl, freely soluble in alcohol, and a strong tincture can thus be prepared; but, unfortunately, on the addition of water separation soon takes place, the liquid first presenting an oily-like appearance, and soon after depositing crystals. Therefore, if a strong spirituous solution is prescribed directions must be given that water in the proportion of at least a drachm to each two grains of the croton chloral should be added before the dose is taken, else the changes I have indicated will ensue, and some of the crystals are pretty sure to adhere to the spoon or glass, or to remain in the patient's mouth, an occurrence certainly not desirable, as the taste of pure croton chloral is far from agreeable.

Case 1.—Mrs. T., æt. 30, suffering from severe facial neuralgia, occurring every night about ten o'clock, was ordered three grains of croton chloral; half an hour after the pain disappeared, and she slept well, which she had not done for some nights before. On the four following nights the pain recurred at the same hour; three grains again taken with similar effect. On the sixth night pain not nearly so severe. On the seventh still less so, after which it did not return. On asking the patient if the mixture made her sleepy, she replied, "No, the pain left me, and then I soon went to sleep." At the time when this statement was made to me I had not seen Liebreich's * paper on Croton Chloral, but I have since found that it is in accordance with his experience, viz.,—"that in some cases of tic douloureux the remarkable phenomenon is exhibited that the pain ceases before sleep sets in."

Case 2.—Mrs. S., æt. 43, a somewhat hysterical female, suffering from supra-orbital neuralgia, appearing every night about eleven o'clock. To take $2\frac{1}{2}$ grains on appearance of pain, to be repeated in two hours if necessary. Soon after the first dose pain abated considerably; after the second it disappeared entirely, and did not return for some nights; when it did, the medicine again acted as on the former occasion.

Case 3.—Mrs. W., æt. 31, had been for some days attacked by intense pain in her right temple, commencing soon after she arose from bed, and continuing with more or less severity during the greater part of each day. When I was called to her it was more severe than it had ever been before. She was directed to take 3 grains every second hour till relieved. Six grains sufficed, and when I visited her on the forenoon of the following day she was quite free from pain, and said that soon after the second dose she felt so well that she had been able to serve her customers "just as if nothing had ever been the

* British Medical Journal, December 20, 1873.

matter." In this case the truth of Liebreich's statement already alluded to was well affirmed.

Case 4.—S. M., æt. 5. Mrs. M., the mother of this child, stated that about seven o'clock of the evenings of the four preceding days the child complained of great pain in the left side of her head, that from that hour it gradually increased, the child becoming so much excited that she feared a fit would ensue. Ordered 40 drops of the syrup on the appearance of pain, to be repeated every half hour till relieved. Two doses sufficed, and the child went to sleep. Quinine to be given twice a day. The syrup was given for five days, and was not afterwards required.

Case 5.—Mrs. H., æt. 25, facial neuralgia, pain occurring about eleven a.m., very severe. Ordered a teaspoonful of the syrup every half hour. After three teaspoonfuls pain ceased, but recurred at same time next day, when three doses were taken with a like result. Prescribed 4 grains of quinine twice a day, and syrup if required. During two following days it was required, but a smaller quantity proved sufficient, and after that, as the pain was only slight, the syrup was discontinued.

I might multiply examples of the efficiency of croton chloral in relieving neuralgia of the face and head, but I must content myself with the foregoing typical cases. In many cases it is necessary to administer quinine or phosphorus for the cure of the disease, the croton chloral being given merely to relieve the pain; but this is surely of itself a sufficient reason for its exhibition. The largest quantity I have found necessary was 14 grains, taken in two hours; generally a very much smaller quantity has been all sufficient, and I agree with the opinion expressed by Dr. Burney Yeo, that small frequently repeated doses is the best mode of administering it, and with this view I would suggest a teaspoonful of the syrup every half-hour till the pain disappears. Were this not found rapid enough, a larger quantity should be prescribed on the next reappearance of pain.

Case 6.—A weakly old man was nearly every night tormented for some hours by insufferable pain along the course of the right ulnar nerve, most marked at the elbow. Ordered 3 grains of croton chloral, to be repeated in an hour. Pain somewhat subsided after second dose, but not sufficient to permit of sleep. Dose increased to 5 grains, to be repeated in an hour: pain much less after first, and disappeared completely a short time after second dose. On following nights 5 grains sometimes answered; on others 10 grains were needed. The man stated that after taking the medicine it seemed to him as if "a fight was taking place between the medicine and the pain, but that

the medicine always obtained the victory," and that he did not experience any of the disagreeable effects on the following mornings which he had before been subjected to after taking opium.

Case 7.—Mrs. W., æt. 70, a person whom I had some years before attended when suffering from sciatica, had been attacked between nine and ten o'clock on each of the three previous nights by excruciating pain, commencing on the outer side of her left foot, and extending up her leg and thigh. The pain lasted for three or four hours, and then gradually left; it was so severe that she, though well accustomed to suffering, was unable to repress her feelings, and gave vent to them in loud cries. Ordered 2 grains, to be repeated in two hours; no effect. Next night, 5 grains on appearance of pain; relief soon followed, and the patient slept soundly. On the three following nights, the pain was bearable, so the medicine was not taken, but after this the pain again appeared, and a 6-grain dose was taken, and soon after its reception it was quite allayed. Before I saw the patient she had taken a large dose of a mixture of chloral hydrate and bromide of potassium, which I had on a former occasion ordered for her, but without the slightest benefit.

I may here mention that in lumbago I have twice prescribed croton chloral, but it proved useless in both.

Case 8.—A stout, robust man, suffering great agony during the passage of a renal calculus, received great relief from croton chloral, which was substituted for opium, which he had been taking, and he was rendered comparatively easy by being kept under its influence until the calculus reached the bladder.

Case 9. M. B., æt. 4. Whooping-cough. Mother said that she had been obliged to rise and attend to her "nearly every half hour" during the previous night, on account of the frequency and severity of the fits. Ordered 15 m. of syrup at eleven o'clock: child passed a fair night; fits frequent, but not nearly so much so as on previous night, and much less severe. Cough returned with former severity at six a.m. Next night, 15 m.: child slept for three hours; after that cough exceedingly frequent, but spasm somewhat lessened. Next night, 15 m. three times during the night: slept well; little cough. The same treatment was continued, with the addition of 8 m. occasionally during the day, and the cough steadily decreased.

Case 10.—M. D., æt. 5. Whooping cough. Paroxysms exceedingly frequent and severe, especially during the first hours of night. 20 m. of syrup at bed-time. Attacks reduced to half the number of former night; child slept well, though wakened occasionally by the cough; but she always fell asleep on cessation of fits of coughing, which she had not done before,

as the spasms, from their severity, rendered her excited and wakeful. This case went on much as M.B.'s. The diminution of the spasm was well marked from the first night the syrup was given. In other cases of whooping-cough where I have employed croton chloral I have had results similar to those above narrated.

Case 11.—Mrs. S., an elderly lady, the subject of a slight attack of pleuritis, took 3 grains every fourth hour, with a double dose at night, and expressed herself as much relieved, the cough being less troublesome, while under the influence of the croton chloral, and after the 6-grain dose at bed-time she slept quietly till five a.m., coughing occasionally, but dropping off to sleep immediately afterwards. The medicine was continued for five days, when it was discontinued during the day, but the nightly draught was still administered, by which a quiet night was insured, though the patient was much troubled by dreams.

In the night-cough of phthisis I have found much benefit from the use of croton chloral. The following is a typical case :—

Case 12.—S. W., æt. 33, complaining of distressing paroxysms of coughing, generally appearing in the early hours of the morning, and continuing with such severity that he never went to sleep after it fairly commenced. Ordered a teaspoonful of the syrup every morning. He called three days after to tell me that the cough had been much lessened, and that he had slept throughout the morning. This patient has now taken the syrup for several months, sometimes one, sometimes two teaspoonfuls, and he says he always derives benefit from its use. I have another case of the same nature under my care, and he has now taken the syrup for ten weeks with marked effect.

In the description of the foregoing cases I have endeavoured to state as concisely as possible the effects following the administration of croton chloral when given for the *relief of pain*; I have therefore purposely omitted the other remedial measures adopted. In the cases of whooping-cough no other treatment was employed.

Mode of Action.—Engel states that under the influence of caustic potash croton chloral breaks up into allyl-chloroform and formiate of potassium, but that allyl-chloroform is extremely unstable, and decomposes rapidly into hydrochloric acid and bichlorallylene, and that the hypnotism induced after the nigestion of croton chloral is due to the product last mentioned. Liebreich also expressed his conviction that, unless when very large doses of croton chloral were given, its hypnotic effects were due to the influence of bichlorallylene.

The potash necessary for effecting the decomposition of croton chloral after it has entered the system is probably obtained at the expense of the alkali of the albuminous substances of the body. This view was brought forward by Liebreich, and more recently by Personne before the Paris Academy of Sciences, as the source whence the alkali required for the decomposition of ordinary chloral is got, and, though the products of decomposition of chloral hydrate and croton chloral differ, the origin of the material required is in all likelihood the same. Further, regarding the effects observed after the administration of croton chloral, Engel points out the similarity of results in the experiments conducted by Liebreich with bichlorallylene to those seen after the use of croton chloral, and this he brings forward as an additional proof of the correctness of his inferences; and he also states that, comparing the effects of chloroform and chloral on the one hand, and bichloride of ethylene and bichlorallylene on the other, he considers himself justified in asserting that, while the trichlorinated substances act upon the brain, spinal cord, and heart, the bichlorinated substances act only on the brain and spinal cord. Liebreich's statement "that croton chloral rapidly produces slumber similarly to ordinary chloral, but without its use being followed, as in the case of the latter, by lowering of the pulse and respiration," is strong testimony in favour of Engel's views. If these conclusions be correct—and, coming from those who have so carefully investigated the action of this drug, one can hardly but accept them—a wide field, in which other hypnotics are inadmissible, is opened up where croton chloral may be with safety and advantage employed. I may add that I can, from my own observations, substantiate the correctness of Liebreich's statement regarding the pulse and respiration.

In conclusion, I may state my decided conviction that, of all hypnotics, croton chloral has the least troublesome sequelæ.—*Medical Press and Circular*, May 12, 1875, p. 400.

96.—A METHOD OF INCREASING THE SOLUBILITY OF SALICYLIC ACID.

By Dr. H. BOSE, Berlin.

An objectionable property of the new antiseptic, and threatened rival of carbolic acid—salicylic acid—is its insolubility in cold water, so that it has been, till now, impossible to obtain a stronger solution of it than 1 part to 300; while the alcoholic solution and the pure acid are too irritating to be applied directly to a wound. Those, therefore, who are specially inte-

rested in comparing the antiseptic properties of the two acids, will be glad to know that the solubility of the latter is enormously increased by the addition of borax to the water, so that as much as ten parts of the acid can be dissolved in 100 parts of water, if eight parts of borax be present. This discovery we owe to Dr. H. Bose, assistant in the Surgical Clinic at Berlin, who has contributed a paper of much interest to the *Berliner Klinische Wochenschrift* (July 12), to which we are indebted for the following details. The solution should be made by first dissolving the borax with the aid of heat, and then gradually adding the salicylic acid to the boiling fluid. Since commercial samples of both these drugs are not chemically pure, a small amount separates, and requires to be filtered off on cooling. The filtrate is a clear yellowish or light-brown fluid, according to its concentration. The proof that the addition of borax does not convert more than a part of the salicylic acid into salicylate of soda—a salt devoid of antiseptic properties—is easily shown; for if we dissolve 6.9 parts of the acid in 100 parts of boiling water, and then add 2.89 parts of bicarbonate of soda, the carbonic acid in the latter is set free, while the soda combines with the salicylic acid, and on cooling there is such an abundant deposition of the excessive acid that the whole liquid becomes nearly solid, owing to the formation of crystals. Now if the whole be reheated until the acid is completely dissolved, and then 3.58 parts of boracic acid added, no deposit of any kind occurs on cooling. The most suitable strength in which the above solution can be used for direct application to wounds, is, according to Dr. Bose's experience, one which contains from $2\frac{1}{2}$ to 5 per cent. of salicylic acid, and 2 to 4 per cent. of borax. Solutions containing more than 5 per cent. of acid are too irritating, and give rise to a very abundant capillary hemorrhage if applied to the surface of a fresh wound. Dr. Bose speaks highly of the result obtained with the boro-salicylic dressing in a number of cases of removal of small tumours. The operations were all performed without the spray, and only the sponges and forceps used were cleansed antiseptically with the above solution. The wound was thoroughly washed with the same liquid, and then a thick layer of salicylic wadding, also soaked with it, was laid on its apposed edges, so as to reach several fingers'-breadths beyond them, and fixed by means of a bandage; catgut was used to tie any vessels requiring ligature. In those cases where the edges of the wound could not be accurately brought together, Dr. Bose put in catgut sutures, and then filled the spaces between the edges with the salicylic solution by means of a small syringe, and applied the wadding over all. The greater number of the cases thus treated healed by first intention, without the formation of a drop of pus.

Among a number of casual injuries treated with the above solution, one especially deserves to be briefly described. A workman managed to cut into the back of the metacarpophalangeal joint of the left forefinger with a saw, so as to divide the extensor tendon, to open the capsule of the joint obliquely, and to tear the cartilage of the head of the metacarpal bone with the teeth. He applied for relief half an hour after the accident. Dr. Bose tied one artery, which was spurting, with catgut, and then kept the wound filled for several minutes with the solution of borax and salicylic acid. He then united the ends of the tendon with four catgut sutures, and finally closed the wound with other sutures of the same material. It was then dressed as above described, and the extended fore and middle fingers were bandaged together on a splint, which only fixed the finger-joints, and did not interfere with the movement of the hand. The patient was kept in bed, but, though he was slightly feverish on the first three days, there was no pain or swelling in the hand to necessitate an examination of the parts, and the dressing was not removed for *fourteen* days, when the wound was found completely healed. Dr. Bose concludes his paper by stating that he has as yet no experience of the value of the boro-salicylic acid solution in dressing *large* wounds, and that he has not found it invariably successful in the case of small ones, but he thinks that the frequency of small wounds in practice, the simplicity of the method, and the facility with which healing by first intention can be obtained by it, render it worthy of a passing notice.—*Medical Times and Gazette*, July 24, 1875, p. 99.

97.—ON THE USE OF NITRITE OF AMYL IN VARIOUS FORMS OF SPASM, AND ON ITS VALUE AS AN AID TO DIAGNOSIS.

By Dr. S. WEIR MITCHELL, Philadelphia.

Dr. Mitchell has for some time entertained the conviction that nitrite of amyl would be a suitable remedy in epilepsy, because it rapidly induces fulness of the vessels of the whole head, and thus would counteract the condition of vascular spasm which characterises the outset of the epileptic attack. The cases, however, are rare in which the remedy can be employed, because the fit comes on so suddenly as to prevent the due administration of the nitrite, but in certain instances the patient has a succession of fits within a limited space of time, and, being then in bed, is so placed as to admit of the trial of this plan. The first case in which Dr. Mitchell was able to test the value of the remedy occurred in 1872, and the result

was quite successful. The case was one in which the disease was caused by sexual abuse, and various remedies had been employed in vain, but, as a last resource, Dr. Mitchell gave the patient three or four drops of nitrite of amyl, and directed him to inhale it by putting the open phial which contained it up one nostril while he closed the other nostril and then made a few full inspirations. At the second trial of the experiment the patient felt his face flush, the carotids beat violently, the head felt full, and the spasm being thus caused to cease, the impending attack was cut short for the first time in the course of the epileptic seizures. On subsequent occasions the attacks were arrested in a similar manner, and Dr. Mitchell reports that for the last two years and a half there have been only seven fits, or rather only one, for all the rest have been cut short by the nitrite. Several other cases are given in which the results were the same, and although Dr. Mitchell does not allege that the drug has any power to prevent the return of the fits, he has no doubt of its efficacy in arresting the actual convulsion. In reference to the aid given to diagnosis by the use of the nitrite, Dr. Mitchell writes with some hesitation, but he thinks that in some doubtful cases of cerebral disease the nitrite may help to clear up the difficulty. When, for instance, the malady is truly epileptic, the nitrite of amyl may arrest the fit in the manner already described; but when the disorder is of the congestive type, the drug may prove useful in settling the question of its nature by reproducing the train of symptoms and thus showing its real character.—*British and Foreign Medico-Chirurgical Review*, Oct. 1875, p. 450.

98.—ON THE RAPID RELIEF OF NEURALGIA.

By Dr. SPENCER THOMSON, Torquay.

[Innumerable are the remedies for neuralgia, but we think with Dr. Spencer Thomson that gelseminum has not had its fair share of use. We have several cases which quite confirm the opinion subjoined of this remedy.]

As one of the newest of the remedies, I would first allude to one which is much too slowly making its way into the domain of practical therapeutics; I allude to the recently introduced "tincture of *Gelseminum sempervirens*," or yellow jasmine. In my presidential address delivered before the South-Western Branch of the British Medical Association, in 1874, I alluded to this remedy as having proved very successful in my hands, and in a paper I read this year at the Plymouth meeting I was able to state how fully it had fulfilled my expectations during the twelve months that had elapsed since my former notice of it.

Directly or indirectly it had been used by me, or by my authority, in at least forty cases to which it was applicable, and with almost constant success. In using the word "applicable," I do so in accordance with my own experience that the remedial power of the gelseminum seems confined to those branches of the trifacial nerve supplying the upper and lower jaw, more particularly the latter, and more especially when in either jaw the pain is most directly referred to the teeth or alveoli; indeed, I can scarcely recall an instance of the above in which relief was not speedily and thoroughly given. The usual expression of the patient has been, "It acted like a charm." In illustration I give one case.

On Sunday afternoon, June 20th, the housemaid of a friend, a retired medical man, came to me with a note from her master, stating that she had been suffering from agonising pain, of what was thought to be toothache, for six-and-thirty hours. Nothing gave relief, and no dentist could be found to remove the only suspicious tooth. I sent her home with a bottle of gelseminum tincture, which I kept for home use, desiring that she should have twenty minims at once, and twenty more within two hours if not relieved. Her master sent me a note in which he stated that the patient had experienced immediate relief.

The above case was not one of distinct toothache, but rather of pain affecting the alveoli generally of the affected jaw. Still, even in toothache seated in one tooth, the remedy gives relief, provided, of course, abscess is not actually in formation. I have observed above, that, according to my own experience, the beneficial effect of the gelseminum is confined to neuralgic pain of jaws generally, and of teeth and alveoli more particularly; and a short paper, in the *Practitioner* for August, 1875, by Dr. Gamgee, of Birmingham, supports the view. In September, 1875, there were published some cases of other neuralgias, even one of sciatica, in which cure was effected, under the care of Dr. A. Jurasz, of Heidelberg. Should the remedy indeed prove generally useful in neuralgia, it will of course give it additional value in our materia medica, but at present it has gained no such position, either according to my experience, or, as far as I can learn, that of most others.

In the notices I have met with on the use of the gelseminum, the doses quoted seem all too small. I now almost invariably prescribe, for an adult, twenty minims of the tincture as a first dose, to be repeated any time after an hour and a half if relief is not given. I have rarely had to order a third dose, and I have never found any inconvenience result from the larger doses. In one instance, a gentleman who, unadvisedly, took thirty minims at once, and immediately afterwards went out

driving, told me he experienced for an hour or two some uncertainty of vision when guiding his horse. A severe attack of neuralgia of the jaw was, however, cured by the one dose, and did not return. One young lady, to whom I gave two twenty-minim doses during the night for a severe neuralgic attack, more particularly of the temporo-auricular branch of the inferior maxillary nerve, complained of a little heaviness next morning. In this case little if any relief was given; but the teeth and alveoli were not implicated, and it is only when these are that complete relief can be calculated on according to my own experience. The above case was at once cured by the solution of phosphorus, to be noted presently.

As further illustration, I may mention the case of a lady who was under my care last winter for local disorder, but who also suffered severely from neuralgia, attacking at one time the lower jaw and at another the orbital and frontal nerves. The gelsiminum invariably relieves the maxillary pain, but has no effect whatever over the frontal. For this, however, for a long time at least, I found a most efficient remedy in phosphorus given in the liquid form. The form I have used is that given by Ashburton Thompson in the Practitioner for October, 1878. It is taken without repugnance, rarely causing disorder of the stomach or eructation, and, what is most important, keeping perfectly. One of the cases I have mentioned was treated with a preparation which had been made four months at least. I have found a twenty-minim dose, equal to one thirty-sixth of a grain of phosphorus, give rapid relief, and, what is important, independent of locality.

Even phosphorus, however, we know, will, after a time, lose its power in some obstinate cases of neuralgia—at all events its power of giving rapid relief; and then it is that the invaluable hypodermic administration of morphia comes to our aid. This remedy, and its mode of administration, are too well known to require comment here; but it is far from being as generally employed as it ought to be. This, perhaps, is due to various causes, but of these I believe the principal are—the means of administration not being always readily available, and the objection of patients to the pain consequent upon the use of coarsely constructed instruments. The first of these objections I have endeavoured to meet by the use of a very portable hypodermic apparatus, enclosed in a metallic case, with ample supply of needles, and the great desideratum, an always moist and efficient piston; and by always carrying a supply of Sansom's gelatine discs, as made by Messrs. Savory and Moore. The second objection is met by the use of very fine steel needles only, as made for me by Mr. Hawksley, of Oxford Street. The discs, which contain one-sixth of morphia

in each, are a very safe and efficient dose for most cases, although in some it may be well to begin with a less amount, and in many it may be advisable to increase the dose considerably—half a grain, or even double that amount. I may here give it as the result of a very large experience in the hypodermic administration of morphia, that concentrated solutions are the reverse of advantageous. In the first place, they are not so safe as the more dilute; and, in the second, they do not act so quickly and agreeably. The usual strength I employ is one grain of hydrochlorate of morphia in forty minims of water, rarely in thirty. The slight increase of bulk is of no consequence, and in administrations I can count by the thousand I have never seen the slightest bad consequence, in the way of abscess or otherwise, result to the patient.

With morphia, and occasionally—but only occasionally—atropia, to use hypodermically; with phosphorus in solution; with gelseminum, aided at times by the ordinary external appliances, such as heat, or freezing if need be; aconite, and chloroform,—one ought to feel fully prepared to meet and subdue at the time most cases of neuralgic pain, and, indeed, of pain generally.—*Lancet*, Nov. 6, 1875, p. 660.

99.—THE COMBINED ADMINISTRATION OF CHLORAL, MORPHIA, AND ATROPIA.

By Dr. BARTHOLOW.

Dr. Bartholow says that the great mass of narcotic remedies are administered conjointly without an adequate conception of the part which each one plays in the results produced. Thereupon he made some experiments chiefly by means of the hypodermic syringe. One drachm of chloral to four of water gives a solution of sufficient density, and 30 minims contain seven and a half grains. Into this solution was put one grain of sulphate of morphia, and into another solution was put six drachms of chloral, four grains of sulphate of morphia, and a quarter of a grain of atropiæ sulphas in two ounces of water.

A solution of chloral injected under the skin causes a smart burning sensation, lasting from five to fifteen minutes, and usually leaving an induration which slowly disappears. This does not, however, seem to tend to suppurate. Absorption quickly takes place, for chloral being a crystalloid, diffuses easily into the blood. It causes a feeling of frontal distension, some headache, and vertigo, and drowsiness, supervening in from ten to twenty minutes, like that produced when chloral is taken by the mouth. One-fourth to one-half the quantity

necessary to produce sufficient effect is required by the subcutaneous areolar tissue as compared to stomach administration; and when combined with morphia and atropia the quantity required need be very small.

Chloral and atropia do not act on each other chemically. Rabbits bear chloral very well indeed, but they are rather unsusceptible to the action of atropia when taken into the stomach, whilst the hypodermic injection of the drug is followed by the usual physiological effects. Atropia prolongs the chloral narcosis several hours. Thus, a rabbit to which Dr. Bartholow gave twenty grains of chloral subcutaneously remained in a state of narcotism six hours; when one grain of atropia was added, the narcotism lasted eight hours. In various observations he made on himself with chloral and atropia combined, Dr. Bartholow observed the following fact: That the excitant action of the atropia hindered the occurrence of the chloral narcosis, but sleep usually ensued after two hours, and was always profound. On the following day the pupils were dilated, the mouth dry, and there was more or less giddiness and headache. These effects were produced by eight grains of chloral and 1-94th of a grain of atropine. The effects of atropine continue much longer than those of atropia.

With regard to chloral and morphia, the latter substance in the rabbit deepens in every way the effect of the former. On his own person, Dr. Bartholow found that when he took morphia alone there was a great deal of discomfort produced—nausea, vomiting, vertigo, headache, and wakefulness. When combined with chloral, the nausea and vomiting are lessened, but not prevented, and sleep is produced. Chloral does not prevent the unpleasant after-effects of morphia—nausea, loss of appetite, constipation, headache, and vertigo—for these symptoms are experienced on waking from the chloral-sleep. Those who bear morphia well are also favourably affected by a combination of chloral and morphia, but in man as in rabbits, morphia increases in the whole sphere of its influence the chloral narcosis. As, however, morphia is synergistic to chloral, a dose of the latter far short of lethal activity will be sufficient in most cases when the former is combined with it.

A combination of chloral, morphia, and atropia presents the greatest advantages from the physiological and therapeutical point of view. Dr. Bartholow has made numerous experiments on his own person in this matter. Chloral causes sleep, morphia relieves pain, and atropia prevents or lessens the depression of the heart and respiration caused by the agents associated with it, whilst it certainly contributes to the cerebral effects of both. He found that the action of the combination was much more agreeable than chloral or atropia or than

chloral and morphia. Sleep followed more promptly, without being preceded by nausea and excitement, and the after-effects were either absent or slight.

Practical Conclusions.—Dr. Bartholow hence concludes that the combination of chloral, morphia, and atropia, in the relative proportions he advises, used subcutaneously or by the mouth, is extremely well adapted to the treatment of insomnia in certain of its forms. In all cases in which pain is an important factor in the causation of wakefulness, the combined action of chloral, morphia, and atropia is much more effective than either agent alone. He cannot too strongly urge this combination in cases of insomnia in the subjects of fatty and dilated heart, and in the irritable heart of the chronic smoker. The combination of chloral and bromide of potassium is ill-advised in such cases. When a suspicion of heart disease exists, it were better to use morphia and atropia than chloral alone.

Pain.—For the relief of pain, says Dr. Bartholow, no one denies that the hypodermic injection of morphia is the most effective agent we possess. On the score of propriety and safety some persons object to it. The hypodermic injection of chloral, morphia, and atropia, barring the greater pain it gives, is more agreeable in its effects, and it seems to him, more permanent in its results. He has used this combination in neuralgia of the fifth, of the brachial plexus, of the lumbar nerves, of the sciatic nerve, and coccygeal nerves, and about the seat of the painful spinal points in visceral and other neuralgias, and in spinal irritation. Whatever may be said in its favour, the remote injection of anodyne for the relief of pain is not so effective as application to the painful points. It is familiar to all how, when the parts swell about a painful nerve, the pain ceases.

The effects of irritant injections about the site of neuralgic pains are sometimes simply marvellous in the relief they procure. Most of the pain-relieving agents, when applied to the nerves themselves, interrupt the transmission to the sensorium of the painful impression. From these considerations we obtain a useful lesson as to the utility of localised injections for the relief of neuralgia. Dr. Bartholow mentions that he has applied this method with success by the “deep injection of chloroform,” and also has used with excellent result the deep injection of chloral, morphia, and atropia.

In neuralgia of the fifth nerve, the injection may be inserted deeply underneath the cheek or lips about the situation of that division of the nerve which is painful. In sciatica the point of the needle should be made to reach the vicinity of the nerve. But he especially calls attention to the good effects of this practice in the cases of that intractable disease *coccydynia*. In

this form of severe pain, the needle should be passed down to the coccyx so that the solution may be made to diffuse over the whole surface of the coccyx. He does not meet many cases of this disease, but in two, the brilliant results which followed justify the most sanguine expectations of the utility of the practice. And so in spinal irritation, and in visceral and parietal neuralgia with points of spinal pain and tenderness, these deep injections are of greatest service.

The hypodermic injection of chloral, morphia, and atropia may, he thinks, be used in minor surgical operations.

In recent torticollis and in lumbago it affords lasting relief. He has witnessed astonishing results from the use of chloral and morphia in the true collapse of cholera. The injection hypodermically of the combination of chloral, morphia, and atropia is of great use occasionally in spasmodic asthma, whooping-cough, and laryngismus stridulus. In angina pectoris, hepatic and renal colic, spasm of the sphincter of the bladder, &c., these agents combined produce results to which they are quite inadequate when used separately.—*Medical Press and Circular*, Feb. 24, 1875, p. 170.

100.—LEAD POISONING BY DRINKING WATER.

By H. C. BARTLETT, Esq., Ph.D., F.C.S.

The prevention of lead-poisoning from its contamination of drinking-water must be held to be one of the most obvious duties, both of municipal and sanitary authorities, and of all persons drawing their supplies from private wells. Water companies are morally bound to ascertain from time to time that their water will not attack lead, or that that metal does not come in contact with it throughout their entire system of mains and private supply pipes and cisterns. In the same way no private well can be considered safe until the action of its water, if any, be most carefully determined at various periods of the year. I have always found that the increase of certain salts in shallow well waters during autumn conduces to a much larger solution of lead than at other seasons.

The new adaptation of a pure tin rose and end to lead immersion pipes, which are lined and coated inside and out with a good substance of solid tin, obviates much of this danger, and I feel strongly that no unlined lead piping should be permitted in any case where the water supply is liable at any time to dissolve or corrode unprotected lead, as unfortunately so frequently happens. Edinburgh is happy in being but little subject to this danger, as I have never found more than .01 gr. per gallon in the water supplied to this town.

But while urging the selection of proper water as far as is humanly possible at the source and deploring the indiscriminate use of lead in pipes and cisterns, I should add that a further precaution may be taken in the domestic household. A very singular and efficient filter has been lately constructed out of the coke of the Torbane Hill mineral combined with porous calcium carbonate. This effectually removes every trace of lead from water percolated through it, including the solutions of all the salts of lead. I have alluded broadly to the requisites of wholesome drinking-water as it should be supplied to the houses of the consumers; but one great reason for the comparative immunity with which so much bad water is partaken arises from the circumstance that much less water is drunk at table as it is drawn from cisterns and wells than is consumed after being subjected to prolonged boiling. Take the constituent water of any article of food, be it liquid or so-called solid, and it will be seen that at least nine-tenths of the total moisture ingested has been strongly heated. It is only when the crystal caraffe, filled with refreshing and pellucid spring water, comes to table that we encounter the greatest risk from imbibing its untempered dangers. On the other hand, the common aerated waters so largely sold and drank are found by analysis to be frequently contaminated with the decomposition of every description of foul organic matters. If to these be added the dangers of impure chemicals and a very general increment of carbonate of lead, held in solution by the excess of carbonic acid, we shall perceive the imperative necessity of being well assured of the wholesomeness of all waters admitted to the table.

Leaden generators, pipes, and joints are simply stores of poison for certain solution in aerated waters made in them, and the extent to which these waters are rendered toxic by their means must be hardly credible to those who have had less than the most extended opportunities of testing the lemonades, soda, and seltzer waters of commerce.

None of the natural mineral waters, except those emanating from sources of exceptional purity, are admissible, and these, as must every manufactured aerated water, require to be bottled under conditions which preclude the dangers of organic matters, lead, and all other chemical impurities.—*Medical Press and Circular*, Sept. 8, 1875, p. 185.

101.—THE DANGERS OF CHLOROFORM, ETC., AND THE NITRITE OF AMYL.

By C. BADER, Esq., Ophthalmic Surgeon, Guy's Hospital.

Some years ago, when nitrite of amyl was first used at Guy's Hospital, Dr. Goodhart and myself studied its effects,

when taken internally, upon the bloodvessels in the healthy optic disc and retina. The effect is as rapid as it is striking. Three or four seconds after taking three drops of the drug on sugar the bloodvessels of the retina (arteries and veins, but especially the veins) become enormously dilated and gorged with blood, leaving no doubt as to simultaneously existing cerebral hyperæmia, with greatly accelerated circulation of blood.

Lately, after observing upon myself the effects of inhalation of the vapour of the nitrite of amyl, it occurred to me that in cases of faintness or of defective breathing or heart's action, while under the influence of an anæsthetic, nitrite of amyl might be of use. A few cases will show the encouraging effects of this agent.

Case. 1.—Given a mixture of alcohol, ether, and chloroform. Young man, hydrocephalic, inherited syphilis; iridectomised on both eyes; suddenly became pale, deeply insensible, with pulse and respiration very defective. Lint, with a few (three) drops of nitrite of amyl, was placed over nose and mouth. In two or three seconds a deep inspiration, followed by others, flushed face, quick pulse, and return of sensibility, were observed.

Case 2.—Given chloroform. A boy, pale, fat, blue lips and cheeks, became suddenly very faint (blue lips, blood turning black, breathing very imperfect). The same quick result, with vomiting, followed the inhalation of the nitrite of amyl (three drops).

Case 3.—Given chloroform. A middle-aged woman suddenly became blue in the face and stertorous (tongue falling back). Lint, with ten drops of the nitrite of amyl, was placed over mouth and nose. In a few seconds the blueness and stertorous breathing gave way to good colour, regular breathing, and sickness and vomiting, though no food had been given for several hours.

The most striking effects of the nitrite of amyl were the quick restoration of breathing, of a good colour, and the rapid appearance of sickness. It remains to be shown whether injection of this agent will have a still better effect.—*Lancet*, May 8, 1875, p. 644.

102.—THE TREATMENT OF CHLOROFORM POISONING.

By S. MESSENGER BRADLEY, Esq., Manchester.

Dr. Hardie's recently reported case has gone a long way towards destroying the proud *prestige* of ether, and towards showing that its superiority over other anæsthetics is purely ethereal. We have still to search for a safe anæsthetic, but,

in the meantime, human beings will continue to imbibe the more or less lethiferous vapours now in vogue, and it therefore becomes important that a concerted plan of action should be agreed upon when danger arises. As matters stand now, one man trusts to galvanism either of the heart or of the phrenic nerves, another puts his faith in artificial respiration, a third is content with flicking the skin with a wet towel in the hope of returning the expiring vital spark, another throws all his energies into opening the windows and pouring brandy down the victim's throat. Now, under the plan of inversion, introduced by Nélaton, recoveries have been effected after a much longer period of apparent death than under any of these; and it certainly is only right to give this method a fuller trial, and to resort to it on the first threatening of danger, and not after a number of other things have all been tried in turn and in vain, and when it would be as rational to attempt to resuscitate an Egyptian mummy.

Though the following case presents no novel feature, and, indeed, is altogether less striking than the cases reported by Dr. Campbell, Dr. Marion Sims, and Sir John Rose Cormack, still I think it worth recording, because it serves as well as another to redraw attention to this important subject, and because it may stimulate those who have opportunities experimentally to determine, first, the condition of the brain in cases of chloroform-poisoning; and, second, the comparative value of artificial respiration in the horizontal and the inverted position. A boy, about eleven years of age, who had previously taken chloroform without any bad symptom, was narcotised in one of the surgical out-patient rooms of the Manchester Infirmary for the purpose of having a large nævus ligatured. Before completing the operation, my attention was drawn to the patient, when I noticed that respiration had ceased; his teeth were closed, there was frothy mucus at the angles of the mouth, the lips were blue, the pulse could not be felt at the wrist, nor, on placing the ear to his chest, could any action of the heart be detected. Several students were present, and, at my request one of them held the boy up by his heels, while I commenced to employ artificial respiration on Silvester's plan, his tongue being meanwhile drawn forward by a pair of forceps. No note was taken then of the time that elapsed before a natural respiration was made; and, therefore, no perfectly accurate record can now be given. We are, indeed, little able to calculate the flight of time under such circumstances with precision; and, conscious of the tendency we have under excitement to exaggerate its duration, I did not myself give any estimate; but, on referring to those students who were mere onlookers, I found that none of them gauged the time at

less than six minutes before the first feeble respiration showed there was still life in the lad. Little by little, the respirations increased in strength, he vomited, and, in a few minutes more, was all right again. It is, of course, easy enough to sling up a slip of a lad in this way, but if we decide to Nélatonise all our patients who show dangerous symptoms, it may chance that some "Manningtree ox" of a man may tax our capacity; would it not, therefore, be desirable to furnish every operating theatre with a hoist by which the weightiest patients might be at once elevated to the necessary altitude, and kept there till the danger has passed away?—*British Medical Journal*, June 12, 1875, p. 772

103.—CHLOROFORM OR ETHER?

By R. BRUDENELL CARTER, Esq.

It may be true, as you allege, that the deaths produced by chloroform are only as one to every two thousand five hundred cases in which it is inhaled; but it is inhaled so frequently that this small proportion amounts to a very serious aggregate. I am acquainted with one surgeon practising in London, who asserts that he has witnessed *sixteen deaths* from chloroform (all of them, I believe, in the course of operations upon the eye); and with another who has witnessed *six deaths*. The mortality, such as it is, is totally without warning. No experience can foresee in what cases it will occur, no skill can do anything to prevent its occurrence. There have, it is true, been a few instances in which life has been threatened by failing respiration, but in these the patient may always be saved if proper treatment is adopted. The deadly cases are those of syncope, or paralysis of the heart, and this, whenever it occurs, appears to place the victim beyond the reach of human aid.

The loss of one life in two thousand five hundred inhalations would not, I think, forbid the use of chloroform in surgery if chloroform were the safest of our anæsthetic agents, or even if it offered any great practical advantages to the administrator or to the operator. But I contend first, that ether is in all respects as available and as effectual as chloroform; secondly that it is *absolutely safe*. I do not believe that it has ever destroyed life, nor do I believe that it has any tendency to destroy it.

With regard to the efficiency of ether, I may say that I finally abandoned the use of chloroform three years ago. Since that time I have performed at least fifteen hundred operations upon the eye at St. George's Hospital, and a

smaller number at the Royal South London Ophthalmic Hospital, using ether as my sole anæsthetic. Its administration requires from two to four minutes, and the anæsthesia which it produces leaves nothing to be desired. It has been in use at St. George's Hospital for a still longer period in general surgery; but until Dr. Joy Jeffries, of Boston (U.S.), taught me in 1872, the proper method of administering it, I did not consider it available for ophthalmic operations. Unless given with great freedom, it does not completely relax the muscular system.

My experience may, I venture to think, be accepted as conclusive with regard to the *efficiency* of ether; and to those who have not found it efficient I would suggest that they have something to learn, as three years ago I myself had all to learn, with regard to the method of administration. On the question of safety, let me remind you that, in speaking of our experience of ether as small, you leave out of sight the colossal experience of our brethren in the United States, who, I believe use ether almost exclusively, and who have had no deaths from its employment. I will not dwell on this part of the subject, because I have written to ask Dr. Joy Jeffries to favour me with an account of the American experience, which, when I receive it, I will transmit to you for publication. My own cases are, of course, insufficient to establish the safety of ether; but they enable me to say that I do not recognise, in the *nature* of its influence, anything which is calculated to be deadly—nor, supposing common care to be taken, do I see in what mode it could produce death. I fully believe in the correctness of Dr. Joy Jeffries' assertion, that, as long as the patient receives air enough to prevent suffocation, you could not destroy life by ether if you tried. No one who has seen much of the use of chloroform can have failed to recognise the oftentimes deadly tendency of its action.

On the grounds which I have thus endeavoured to set forth, I hold that the use of chloroform in surgery can never be necessary, and, as an inevitable consequence, that it can never be justifiable. I make an exception in the case of young children, for whom chloroform is scarcely dangerous, and I do not refer at all to the practice of midwifery, in which the quantity and method of administration are such as to make surgical experience inapplicable. But I hold that no medical practitioner, merely because he has used chloroform without accident until now, or merely because he has not learnt how to use ether, is entitled to expose a patient to the risk of being the one person who will die, although two thousand four hundred and ninety-nine others may escape.—*Lancet*, Aug. 7, 1875, p. 227.

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